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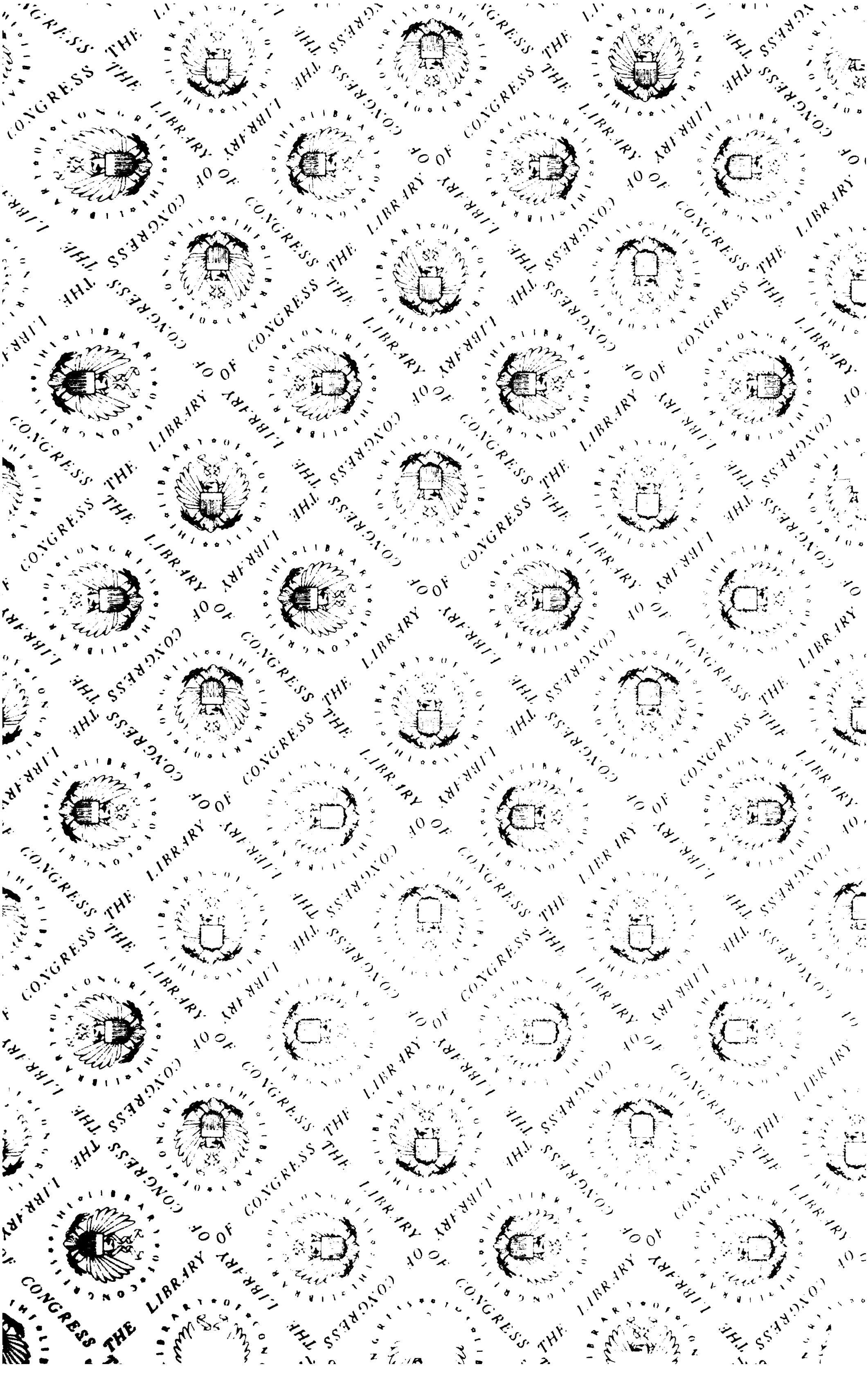

THE

COUNTRY GENTLEMAN'S MAGAZINE

WITH ONE HUNDRED AND THIRTY ENGRAVINGS

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THE GAME-LAWS AND GUN-TAX.

THE Chancellor of the Exchequer, it will be seen, has quite altered his tactics with regard to the Gun-tax. He is going to maintain the Game-certificates, which he proposed to abolish, and at the same time impose the £1 license, or at all events some license upon the carrying of fire-arms. Those, however, who have paid for Game-certificates will not be liable for the gun-duty. The £3 or £2 that they pay, as the case may be, for their certificates, will include also, or exempt them from, the £1 license duty on the carrying of guns. This change in his intentions, the Chancellor of the Exchequer stated, in his place in the Commons, on the second reading of the Bill, was one that had been made in deference to what he understood to be the general feeling of the House, and having conceded this he thought it would rest with the House now whether a reduction in the proposed amount of duty might not be made. A considerable amount of discussion upon the question took place; but ultimately the Bill, as altered, was read a second time.

We must confess to share with Mr Hunt in his regret that the Chancellor of the Exchequer should have decided to retain the Game-certificates. As the Bill stands now, it is literally imposing a new tax, instead of, as it was made to appear at first, reducing an old one. The tendency of recent legislation has been decidedly in the other direction to the one Mr Lowe has here pursued. It has been to repeal and mitigate duties, not to increase them or impose new ones; and while relieving the taxpayers, the tendency has also been—by saving expense in collection, and making it more certain that those liable were brought in for their due share—to bring more money into the Treasury. Mr Lowe is seeking to impose a new tax in what can hardly be called other than by a side-wind. He led us to suppose that he was granting a boon to the public fond of sport, and, lo! now he keeps up the £3 and the £2 upon the classes which paid before, and he settles £1 upon all who care for a day's crow-shooting, and whose sporting proclivities, perhaps, cannot be gratified above once a-year. Twenty shillings for a day's enjoyment of this kind is a little too heavy. And while it will press hard upon amateur shooters in a small way, it is too much to hope that it will act as a deterrent upon poachers. If a gun is essential to them, they can soon make the amount of the tax out of their unlawfully-gotten game; but at all times the poachers depend more upon cunningly-trained dogs and insidious snares to fill their bags than upon fire-arms.

We supported the Gun-tax on two grounds—First, because it promised to bring more money into the Exchequer than the Game-certificates; and next, because it would not be so heavy upon those who have the privilege of a few days on the hills, or in the stubbles during the season, as the present license is. We supported it very much from the same motives that Mr Hunt does, not because it would relieve the rich, but that it would "enable poorer persons to enjoy the pleasures of sport at a moderate rate." And in order to prevent poaching, we would have such a provision as Mr Hunt suggests, viz., to withhold the license from any person found trespassing in pursuit of game or committing any offence with fire-arms. We entirely agree with Mr Muntz, that the Bill has now materially changed its character, and that it will require careful revision in Committee. If the old Game-license is to be retained, urged the hon. gentleman, no tax on guns ought to be imposed, and he intimated that when the Bill went into Committee he would be prepared to move to that effect. Mr Sclater-Booth also regretted that the Chancellor of the Exchequer had not adhered to his original resolution, and ironically congratulated Mr Lowe upon the support which his alteration was meeting with from game-preservers. Mr Craufurd thought the Chancellor of the Exchequer had been a little too precipitate in the expression of his intention to maintain the Game-certificates, while he imposed a gun-license, and added, that the Inland Revenue Department was "intensely reluctant to be made the means of prosecuting poachers in consequence of a tax being levied on guns." It is evident, therefore, that the Bill will not pass on to its third reading without being carefully scanned. We will now need all the more—if we are to have both Game-license and Gun-tax—to have clearly defined what is really intended by the word *curtilage*, upon the meaning of which doubts have been expressed.

But what made us most anxious to have the Gun-tax imposed and the Game certificates done away with, was, that we thought this would lead to the abolition of the Game-laws, that, in fact, it practically was the abolition of those laws which have been such a fertile source of contention between landlord and tenant, and, indeed, the public generally. All the discussions we have had about them—and we have had enough in all conscience during the last two or three years—have brought us no nearer the desired end, viz., the reconciliation of the two great classes interested, landowner and farmer. On the contrary, they have helped to widen the breach between them, to fan rather than allay the fury of the flames. Every Bill that has been brought in to amend the laws has been objected to in its turn, and every one who has undertaken the task of arbiter, on urgent appeals from tenants, has been fallen upon and rent. Nay, worse than that, farmers have turned one upon another and torn each other, even as they did those by whom they are aggrieved, and the men who tried to settle their grievances. Could anything be more pusillanimous than the proceedings at Norwich, when a motion was rejected by an enormous majority, and carried at another stage of the meeting by a large number of votes? And then look at the Central Chamber meeting, the one that assumes to be the mouthpiece of the agriculturists of England, and say whether it is likely that out of that chaos order is likely to be evolved. In fact, by abolition alone, we think, can anything like satisfaction come, and we do not believe that when once all this kind of sentimentalism and angry feeling, which have aggregated about the Game-law, have been disintegrated, if not dissipated, by abolition, that then we shall better arrive at something like unanimity as to how to make contracts about game in leases fair and equitable, between both the contracting parties.

A WORD IN SEASON.

WE are indebted for the following seasonable and sensible article, to our excellent contemporary *Land and Water*:—

The wholesale and cruel destruction of our various land birds, carried on, we regret to say, more or less all the year round, demands, we think, that prompt measures should be taken for its immediate suppression. Sea-birds are happily freed from the barbarous slaughter to which they once were subjected, shot down, as we too well know, by the dozen, even whilst feeding their fledglings, to gratify the demands of a ridiculous fashion.

The Act for their protection recently put in force is yielding good fruit, and appears likely to amply fulfil the anticipations of its benevolent framers. To shield from wanton persecution—murder is not too hard a term—our feathered friends, that we may collectively class as land-birds, two systems present themselves for our consideration—morally, through the influence of a powerful society, having for its aim the preservation of rare birds that only occasionally visit our shores; the other, the more comprehensive and stringent legal enactment, for the protection of land-birds of all descriptions. As regards killing *game* we have nothing to say, save that we should be glad to see an effective stop put to destroying ruffs, plovers, &c., so late in the year; we may see any number strung up this very day, by taking a survey of the markets and game dealers' windows.

Few of us perhaps sufficiently consider how entirely dependent we are, from the ruler of the land to the humble peasant, on the lowest as on the highest forms of life; even the well-being and stability of a nation is materially influenced by the condition of its flora and fauna. But for the help of insects, that, in roaming from flower to flower, unconsciously it may be, nevertheless just as efficiently as though it were the work of design, bear along with them the fertilizing pollen, we should have few prolific seeds or fruit-yielding blossoms. The winged labourers take their toll from the general harvest, and in their turn become food for other living things stronger, swifter, or more crafty than themselves. Exterminate the insect-feeding birds and the consequence must be, that the formidable army we read of, "the palmer-worm, the canker-worm, and the caterpillar," will devastate the fields, gardens, and orchards; or in other words, permit the insect republic to get the upper hand, and they become a destroying army instead of a community of useful fertilizers. Kill down the birds of prey, then the fruit and seed-feeders together with birds that devour insects, gain the ascendancy, and do incalculable damage directly and indirectly to the tiller of the land; furthermore, it was mercifully ordered by an all-wise Creator, that the sick and disabled amongst the lower animals should be immediately destroyed by furred and feathered executioners. The preyer, as a rule, is usually of greater strength or superior intelligence to the preyed-on; if the preyers are destroyed, sickness and disease may result, and so increase as to become a very pestilence. The balance in nature is so equally adjusted that any meddling with it is sure to destroy its equilibrium.

> Whatever link from nature's chain you strike,
> Tenth or ten thousandth breaks the chain alike.

A correspondent suggests the organization of a society for "protecting and preserving, as far as possible, all such rare birds as are at times seen in England, from the wanton and useless slaughter they now meet with."

We entirely agree with him upon the advisability of such a step, and we go further, and say, the sooner some stringent measure is put in force, for the due protection of land-birds generally, the better. The gun tax may, and we earnestly hope it will, put an end to that most abominable practice Sunday shooting; but such a tax cannot touch the "bird-catcher," he may continue to ply his calling with impunity. At this very time, when the birds are busily nesting, we see dozens of these bird-catchers passing our house on Sundays, on their return home from the fields, laden with cages, decoy-birds, clap-nets, and "limed-twigs." Now that the question of protection has been fairly mooted, we trust it will not be permitted to rest until something definite and effectual be accomplished to insure the safety of our land-birds, at any rate during the period of incubation.

Farm Implements and Machines.

TRACTION ENGINES AND THEIR FARMING USES.

DID time and space at our disposal permit, it would doubtless be very interesting to trace the history of the traction-engine, from the first type or model met with in the road locomotive, which attracted so much attention some thirty years ago, to those recent and more ponderous constructions by which a high running speed is not so much aimed at as great tractive-power, capable of dragging heavy loads over rough ground and up steep gradients with as much ease, comparatively, as on smooth and level surfaces. But time and space failing us, suffice it to say, that the agricultural traction engine had its direct origin in connexion with the custom which prevailed in some parts of the country, especially in its southern districts, of taking threshing-machines, and the portable steam-engines by which these were worked, from place to place, for the purpose of letting them out to those farmers who had neither machines nor engines of their own. In place of dragging the steam-engine, as well as the threshing-machine, along the road by the power of horses—at all times a tedious as well as a costly process—the idea very naturally suggested itself to some engineers of using the power of the steam-engine, as horse-dragged, not only to move itself along the road, but to drag behind it the threshing-machine which it was designed to work, when both had reached their destination. The introduction of the steam-ploughing system gave also an impetus to the perfecting of the traction-engine, some of the engines employed in one or other of the modes introduced being capable of self-propulsion. Some engineers, indeed, conceived the idea of so using the engine, that while it propelled itself, it, at the same time, gave motion to "digging" or cultivating apparatus for acting on the soi of these, Usher's, Romaine's, and Hoskyn engines, may be cited as examples. Whil others conceived the application of the sel propelled engine to the ordinary ploughin and cultivating apparatus, in the usual way c dragging these behind it, as the horse drags th plough: of these, Bray's and Boydell's may b cited as examples. For some time, especial after the International Exhibition of 1862, co siderable attention was drawn to the subject traction-engines, and many were introduc into practice, both for agricultural and gener trade purposes; but a comparative lull short took place in the interest attached to t subject, until recently it has again revive and considerable discussion is now ag taking place, more especially in connexi with the direct application of the traction the preparation of the soil for crops; a much speculation is abroad as to what tl proposal will come to, in the way of practi adaptation to the needs of practical farmi We conceive the time, therefore, appropri for entering, however briefly, into a consid ation of the whole subject.

The modern "traction-engine" is frequen compared to the railway locomotive, and s prise is not less frequently expressed at t slowness with which improvements in tracti engines are carried out, in view of the f that so fine a model for copying exists that used on our railways, the main thi apparently thought of being this, that all tl is necessary is simply to transfer the lo motive from the rail to the road, and the w is done. But these views, though held many, are held only in ignorance of the gr difference existing between those two ty of self-propelling and dragging engines, and the vastly different circumstances under which they work. It will be well briefly to glance at these differences. The first and most obvious difference in the circumstances in which they work, is the nature of the "way" on which they respectively travel. For the locomotive a permanent way is established, which reduces the friction to a minimum, and enables the speed of the driving wheels to be kept up at a high velocity, dispensing with all intermediate gearing to reduce their speed as compared with that of the engine. In the locomotive, with the high velocity given to the driving wheels, comparatively little tractive force at the rails is given to them; but in consequence of the fine condition of the way on which they run, the engine is capable of dragging heavy loads at high speed. To increase the adhesion between the wheels and rails, lessened materially in consequence of the fine state of the permanent way, great weight is thrown upon the wheels by the locomotive itself. In the locomotive the high speed induces a series of shocks, which are provided against as much as possible by the intervention of springs, which, *as a rule*, have not been nor are now applied to traction engines. The springs serve also to distribute the weight of the locomotive equally upon the whole of the wheels. So much for the circumstances under which locomotives upon railways work. Traction engines work under very different ones. First, the nature of the road, with its ever-varying characteristics—characteristics which, as a rule, are much more antagonistic than favourable to easy running; such as inequalities in the surfaces, and the existence of very steep inclines or gradients, as much as one in fifteen, and even one in ten. While the friction which the locomotive has to overcome by contact with the rails may be set down at 10 lb. per ton, that to be overcome by the traction-engine, even on what may be called the best roads, is as much as 70 to 75 lb. per ton, or seven times as great as that of the locomotive. This necessitates, therefore, arrangements in the traction-engine by which a high degree of tractive force at the ground may be secured, and which has of course given rise to all the varied contrivances by which the "bite" of the wheels, or their adhesion, has been attempted to be secured with efficiency, and at which we shall presently glance. The greater tractive force necessitated by the condition of the roads upon which traction-engines run, is obtained by reducing the speed at which the driving-wheels revolve—the speed of the engine remaining nominally high, as in the locomotive. The reduction of the speed of the driving wheels, as compared with that of the piston of the engine, is secured by the intervention of gearing between the shaft of the engine and the axle of the driving wheels, as pitch chains or toothed gearing. The tractive force required in the case of a traction-engine will necessarily vary with the varying characteristics of the road—its comparative roughness and smoothness, and the absence or presence of steep hills, or gradients. Means are to be provided for enabling the engine to meet the varying circumstances. One, if not the best, way is to have two speeds of the intermediate gearing, keeping the speed of the engine always uniform, or nearly so. By having two speeds, when a piece of tough work is before the engine, the slow speed of the gearing is put on, and the tractive force increased. As a rule, traction-engines have been made with gearing not capable of change, so that the engine alone is to be depended upon for increasing the tractive force, thus causing its speed always to be varied. For this purpose a surplus pressure of steam is necessary, so that when the tough work comes, it is overcome by drawing upon this surplus steam. In the long run, the plan of having the gearing adapted to different speeds, keeping the speed of the piston as uniform as possible, will be found the most economical and best adapted for the circumstances under which traction-engines work.

The nature of the road upon which traction-engines run, increasing, as it does, the friction to a high degree, necessitates, as we have said, an increase of the tractive force at the ground, by reducing the speed of the driving-wheels; but to convert this propelling power into tractive force, bite or adhesion of the wheels is necessary, and, as we have said, a variety of plans, more or less complicated, have been introduced. The usual method adopted was simply increasing the breadth of the tire of the driving wheels, this being as much as 18 inches. When the road is hard at the surface, this addition to the breadth enables the necessary "bite" to be obtained; but when the surface is soft or yielding, the mere revolution of the driving wheels has the tendency to form a rut or groove in which the wheels continue to revolve without progressing. To obviate this under such circumstances, some makers have added projecting blades or ribs to the tire of the driving wheel. These being permanent fixtures, exercise a bad effect upon good roads, where they are not required; to get rid of which objection, some inventors have added mechanical appliances more or less complicated, by which, when required, blades could be made to project from the periphery of the wheel, these being easily withdrawn when the necessity for their use was done away with. Without wishing to detract from the merit of all such inventions, we may say that up to the present time, by far the best method of overcoming the difficulties we have been noticing is the adaptation of the india-rubber tire invented by Mr Thompson. This has been already described in the pages of this journal, so that there is no necessity for us to say more of it than merely alluding to its high merits.

The Farm.

THE GAME AGITATION.

"CONFUSION worse confounded" must be the conclusion of all impartial ersons who have carefully watched the pro-ress of the discussion upon the Game-laws. he agitators against them resemble nothing much as spoiled children crying for the oon. Nay, indeed, they have not even the learness of vision of the little ones; the abes see there *is* a moon, and the folly of eir crying for it consists only in the utter npossibility of their ever being able to clutch e orb themselves, or get any one to hand down to them. The tenant farmers just ow, with the Game-laws as a text, are crying r they know not what. They see no moon, is mere nebula, and so obscure, or other-rise diverse are their organs of vision, that hey cannot agree in what particular part of he heavens that hazy luminosity is situated.

To leave metaphor, every Bill for the mendment, or abolition, or modification of he Game-laws (about the nature of which, by he bye, half of the speakers do not seem to e very well acquainted), have in turn been bjected to by those whose grievances the Bills were intended to settle or to remedy. n fact the good intentions of the authors of hese Bills have on various occasions been tigmatized as designed attempts to make the ssumed chains of bondage, which bind ten-nts in the matter of the Game-laws, more alling. Dropping hares and rabbits out of he Game-laws in Scotland would not do, lthough that was what in that part of the ingdom appeared at the time to be wanted. Mr M'Lagan's Bill, after at first getting a arge modicum of support, was tossed over-oard as going either too far or not far nough, it was difficult to make out which. Mr Loch's Bill, which made it positively illegal for any lessor and tenant, by any lease or agreement between them, verbal or written, or otherwise, to divest or deprive the tenant of the power to kill and take hares and rabbits, or to restrict him in the exercise of that power; and any lease or agreement entered into or made in contravention of said section was declared to "be void, and of no force or effect." Well, this Bill was denounced as altogether immoral in many quarters; and some of the most important organized bodies of Scottish agriculturists cried out, Gibbet it, we shall have none of it; give us not this Bill, but Mr M'Lagan's, or let "all be as before."

Then there were some of the milder and cooler sort rose up and said, Let not this measure fall into the hands of any private member, but let it come from the Government. It is of too much importance to appear with any other but Cabinet names upon its back. Let us appeal to the Lord Advocate. He is a man of Liberal ideas, he is a shrewd and acute person; being trained up in the Courts of Law, he will at once appreciate the gross injustice we are subjected to through the operation of the Game-laws, and with pleasure will remove the heavy load from our shoulders. It is true that we cannot explain to him what it is that we want. All our discussions have only served to shew that we are far from being agreed among ourselves; but we shall come before him asking, and although our wishes are each after his kind, and diverse, the Lord Advocate will serve the hotch-potch of ideas submitted to him into a savoury and wholesome lawful dish. We, indeed, have "but an angry fancy," but he shall tell us "what it is that we should do." The Lord Advocate agreed to oblige them, and the result is, what?—that even as Messrs

Loch and M'Lagan were abused, so likewise has been Her Majesty's representative in Scotland.

With those in the south, the feeling about the Game-laws is of a similar and an equally strange character. Here the tenants have all the wild creatures on the land to themselves. The landlords cannot kill, either in cover or in open, winged or four-footed game, unless they have previously got the tenants to sign over to them by lease the rights of shooting. Yet they clamour for the abolition of a right on the part of the landlord, of which he is only possessed through their having knowingly deprived themselves of it! They are far less to be pitied than Esau, for they are not only like him, foolish in selling their birthright for a mess of pottage, but they are silly and selfish enough, having swallowed their pottage, to wish their birthright back. They would both eat, and yet retain their pudding; a sleight-of-hand trick of very difficult performance!

Before anything satisfactory in the way of legislation can be hoped for, farmers must first arrive at something like an agreement among themselves. At present they appear to be just

> "Like infants crying in the night,
> Like infants crying for the light,
> And with no language but a cry."

We still think Mr Lowe's plan of abolishing the game licenses and imposing a tax on guns the best yet under the consideration of the public, and the one which, with certain necessary privileges to farmers, is likely to quash the disagreeable feeling about the subject at present prevailing.

ADVANTAGES OF LAND IRRIGATION.

THE dry spring of this year has been very inimical to the growth of all kinds of crops. The grass has been "very backward in coming forward," to use an Irishism common in this country; and wheat in a great many instances, over a large tract of country, has never come forward at all. The decay and destruction of the wheat resulted in the end from a white maggot, but how far the presence of that grub is attributable to the drought, which made the languishing young shoots an easy prey, has not, so far as we are aware, been clearly ascertained. But all experience teaches us, as noticed before, that lack of moisture, while greatly against the progressive growth at an early stage of any seeds or plants usually cultivated upon the farm, is highly conducive to the "health and prosperity" of the pests which destroy them.

It is, therefore, very apparent that a system of irrigation would have been of immense importance in such a spring as that which we have this year had. Permanent pastures would have been greatly improved by its application, and the food which the grass must have supplied to stock, when placed under the invigorating aqueous influence, would have saved the agriculturist not only much expense in the way of artificial substances, but also a considerable amount of money upon cattle and sheep; in so far that, with an irrigating appliance, he would not have been forced, as he has been, to consign his stock to the markets, whether they were falling or not.

It must have been observed by all interested in the breeding and rearing of, and dealing in cattle and sheep, that this year there have been more and sudden fluctuations in the cattle markets than for several years; and, there can be little doubt that these have been entirely owing to the scarcity of natural food in the country—of last year's roots and fodder, and this year's grass, through want of heat and rain. As soon as a good market was reported, dealers scoured the country and picked up cattle at higher rates than the same stamp had been bought at in the week previous; farmers anxious to get rid of ani-

they could not, except at great
nger sustain, hurried them into
t, which, in consequence, was
l the result was a decline in prices,
to all who were sellers. Then the
recorded in a full market made
o could hang on at all, chary of
the following market, and the
eing small, the value was again
her. And so throughout this sea-
exceptional one, as we have al-
ated, this kind of see-sawing has
on.

s certainly not in man's power to
nes and the seasons—it would be
him for a moment to think so—but
vithin his province, nay, it is his
ity, to make use of the intelligence
has bestowed upon him to assist
he utmost of his capacity when she
act, man is part and parcel of
l if he supplement not one lacking
it is possible, how can he expect
by the great mother when he is
f he do not, then must he be
he man in the parable who turned
talent to good use, and lost it in
e. Well, it is possible for man to
re in such years as the present,

n the clear and cloudless sky
efuséd ae wee drap o' rain
erdure parched and dry."

we trust, will excuse the alteration
y taking from the rills and rivers
, and disposing them over the land
as "droppeth the gentle dew from

of irrigation has long been em-
Mr Isaac Brown, of Edinburgh,
een attended with very marked
n grass. Many of our readers
seen it working at the Great Inter-
ow at Battersea, and since then
n in other places marvellous re-
ed upon Italian rye-grass with it in
. Lately, Mr Robert Hutchison,
ly, one of the largest corn-factors
d, has been experimenting with
lied to grass land according to
Mr Brown's system, and we have now before us two reports upon the results of the process from two independent and intelligent Scotch farmers, Mr Adam Curror, The Lee, whose name stands prominent in Scotland as a valuator in all matters connected with farming reports, and Mr Rintoul, Kingston, North Berwick, who, as the farmer of East Craigie, is well known as a grower of early potatoes, and as taking two crops of this esculent in the year.

Mr Curror says:—

> There was a marked contrast between the irrigated land and the ground adjoining; the crop of grass on the former being fresh and luxuriant, while the latter was scorched and withered. The means used for watering appeared to be at once suitable, simple, and economical. The land requires no preparation for its application, all that is needed being to lay the pipes along the surface of the ground.
>
> The present season has been an unusually dry one, and farmers and graziers have suffered much from want of keep for their stock. In all such cases in which the application of Brown's system of irrigation is practicable, its operation would, in the reporter's opinion, not only have prevented all loss from the long continued drought, but would have been a positive source of profit, because the heat, which, in the absence of moisture scorches the grass, would have greatly increased the fertility of the irrigated lands.
>
> It appears to the reporter that the application of this system of irrigation, in conjunction with a moderate use of guano or other light manure, would be not only highly beneficial both to pasture and hay crops, but in all seasons would prove a profitable investment. This would be especially the case where there is natural waterfall; but it would also hold good where steam-power can be readily used.
>
> Upon the whole matter, the reporter regards the system as one of great practical importance; and is of opinion that its general adoption by agriculturists would enable them to maintain an increased number of stock, and to be practically independent of drought.
>
> The reporter begs, in conclusion, to express his decided opinion that Government and Land Investment Companies could, with the utmost safety, advance money for the application of Mr Brown's patent. A very heavy return in hay or pasture is always certain, and it is to be remarked that, from the nature of the material used in the construction of the apparatus, its value never deteriorates more than about 25 per cent., thus securing in any case a return of 75 per cent. of the capital laid out.

Mr Rintoul writes:—

> By the application of this patent, an artificial shower of pure water is produced and regularly diffused over

the land, thoroughly and regularly saturating it, and washing all into the soil, thereby giving an immediate return. This system of irrigation being now quite practicable where river water can be had in regular supply, and by the application of steam or water-power, or natural pressure, with the aid of Government grants for supplying the machinery, I have no doubt will pay well, particularly on dry soils, as it is certainly the most effective way yet introduced of getting full value for all top-dressings which are very frequently ill accounted for, particularly in a dry spring or summer, whereby much money is yearly being sacrificed at the cost of the agriculturist. It would be of great service to stock-farms, where river water in general is plentiful, combined with meadows or holms adjoining the same, where grass, early in spring, or a large crop of hay, during summer, may be grown with certainty when the weather may be hot and dry, with pastures burnt up all around. If carried out on an arable farm it could also be made of immense benefit in the spring by supplying moisture to the young braird when the weather was warm, and withholding it when cold, so that the top-dressings would be brought into action and the crop forced forward, so as to overcome the many dangers which a backward spring often submit it to. The benefit to green crops especially would be of the utmost importance. Early potatoes could be protected from frost through this process, by giving them a shower before sunrise. Turnips could be brairded and carried on in a dry summer, and even a succession of green crops might be got, whereby a much larger stock of cattle might be kept on a farm, and fed off a given number of acres. For dairy farms, the adaptability of Italian rye-grass for irrigation and top-dressing could fully be taken advantage of, and a constant supply of green food kept up throughout the whole season. For market gardens it would be equally advantageous. What most of all recommends this mode of irrigation with pure water above all others yet brought forward is, that there is almost no labour connected with its application, the expense being principally in the first cost.

The cost of growing grass or hay by this system may thus be estimated, according to Mr Brown, whose own account of the advantages likely to accrue from the use of his patent is as follows:—

Where a suitable pressure can be obtained by water gravitation, capital necessary for its construction obtained from the Land Improvement or other Government Drainage Companies, in terms of their Acts of Parliament, would only form a yearly rent charge upon the land, per acre, of about

rent charge upon the land, per acre, of about	£1	5	0
Say rent of land - - - - -	2	10	0
Manure and superintendence - - -	3	5	0
	£7	0	0

The produce of grass in such cases may be taken at not less than 30 tons per acre; or, if made into hay, 7 tons, or at a cost of 4s. 9d. for the former, and 20s. for the latter, per ton. The question, would it pay at this for the production of beef and mutton, is answered from the fact, that the grass obtained by repeated experiments upon permanent pasture when under this mode of irrigation, has been pronounced by leading agriculturists of a superior quality, and suitable in every particular for fattening cattle and sheep, and at 4s. 9d. or 5s. per ton, must be cheaper for summer food than the best turnips are for winter keep—which, as a rule, in districts most adapted to their culture, cost from 7s. 6d. to 10s. per ton. The same question applied to that of milk and butter shews a larger margin, but when to milk for town's consumption, it points out still more the especial advantages of the system, which opens up a wide field for the successful management of dairy farms for the sale of milk, giving better facilities for promoting the health of cows than town byres, and overcoming the difficulty hitherto felt in keeping them with a sufficiency of green food throughout the summer.

The watering of agricultural and other crops, combining the utilization of manures, is not the least important feature in the system; for, from a want of moisture, the total loss of both is a common occurrence, and green crops over whole districts are frequently so stunted from this cause, that any remuneration to the farmer is barely equivalent to the mere outlay for labour; in such cases, rent of land, and value of manure unaccounted for, is, upon a moderate calculation, a loss sustained by English agriculture of from £5 to £7 per acre, but upon the best and well-farmed land in Scotland it would range from £10 to £12. Here, then, is something to save even upon turnip crops, not to mention those of a more valuable description. The application of moisture at the right time, and in form and quantity for effecting this saving, can undoubtedly be commanded through this system of irrigation; and at no greater annual cost than of about 30s. per acre, by which crops would not only be saved, but their larger and more perfect growth would become a certain result.

When water gravitation cannot be procured to give a pressure of 300 feet, steam-power for raising it from rivers, or other sources of water, will not increase the expense of the system much, and would be even cheaper than gravitation where the pressure is not over 150 feet, from its effecting a considerable saving in the outlay for pipes.

A suitable engine of about 16-horse-power, and pumps, would irrigate 400 acres of land daily; the yearly rent charge for the outlay, with Government land improvement capital, including coal at 7s. 6d. per ton, and the raising and irrigating this amount of land with 400,000 gallons of water daily for 100 days in the year, would not exceed 3s. per acre.

But take, for example, the irrigating of 100 acres with the same engine and pumps, and the raising of water to a pressure of 300 feet, the additional yearly ge over that of gravitation at the same pres- be estimated at about 10s. per acre, which lude an outlay for coal at 7s. 6d. per ton (the rice in Scotland south of the Tay), and suffi- working 100 days in the year, to raise and oo acres with 100,000 gallons of water daily. tem of irrigation, from the nature of the used in its construction, would be, at the end d of twenty-five years, the term at which it come free from the rent charge for capital in- n perfect working order for many years to d 75 per cent. of the outlay would, at any riod, have a convertible value :—for instance, borrowed at the previously estimated rent £7500 of this amount would have a value, so to speak, as permanent as the land over which the irrigation had been conducted.

This account, of course, must be taken *cum grano*, as all patentees, like all mothers, are certain to think their own progeny the best, and "say it themselves who should'nt say it." But from our own observations, we certainly believe that Mr Brown's system will prove very valuable where water can be obtained and distributed without the necessity of employing expensive machinery in connexion with it.

THE WHEAT CROP.

E unusual dryness and warmth of last summer was remarkably favourable promotion of insect life. In autumn estructive abundance was manifested lmost unprecedented degree, and fears ery generally entertained that, should a inter intervene, the present would prove n in which they would reappear in far than ordinary numbers. Although fears were somewhat allayed by long cted frosty weather, causes of alarm e success of the ensuing crops are y but too apparent; and in none have een more fatally exhibited than in that wheat, which, from presenting a full e appearance in thickness, as well as of plant, when commencing its spring , has so completely failed in many ts, that thousands of acres have been ed down and resown with barley, or ned up with a seeding of the well-known maturing bearded April wheat. This pread devastation cannot but appear re remarkable, when it is considered has been effected by a more tiny and ificant looking insect than our com- house fly, and that the losses it causes ot only in many instances ruinous lividuals, but take rank among great al calamities.

riculturists, it must be admitted, are, as a class, unpardonably negligent in investigating the natural history of both their insect enemies and friends, although none have better opportunities of studying their habits and transformations, and observing the modes by which the former destroy their crops, as well as the ways by which they, in turn, are preyed upon and kept in check by the latter. Nor are entomologists sufficiently versant with the more minute, although by no means least destructive insects; for although they can descant largely and learnedly on the beetles (Coleoptera), butterflies and moths (Lepidoptera), and others of the more attractive races, they are still very deficient in really practically useful knowledge regarding the Aphidæ, Coccidæ, and others of the group Homoptera, the two-winged flies (Diptera), saw-flies, midges, ichneumon-flies, and others of the family Hymenoptera, &c. Many practical plant cultivators are prevented from studying the habits of insects from a mistaken notion that it is an uninteresting and trifling occupation, unworthy of their attention; or from an idea that it is insurmountably tedious and difficult of performance. We will only refer the former to the injury which, less or more, their crops yearly sustain from insects, and to the occasional amount of ruinous losses of which these pests are the cause, and ask whether these are not something more than mere imaginary trifles; and to the latter, we will only adduce the example of two investigators, neither of whom aspired to the title of entomologists, viz., Mr Patrick Shireff, of East-Lothian, and the late Mr Archibald Gorrie, of Perthshire, who, in 1828, when the wheat-midge, Cecidomyia (Tipula) tritici, was devastating the wheat crops to an extent never known before or since, made such thorough investigations in regard to it, and its parasitic Ichneumon, that in regard to these they have ever since been quoted as the best authorities by agricultural as well as by entomological writers.

To the question, what is the matter with the wheat crop this year? the usual reply of farmers is, that "wireworms, or some kind of grubs, are eating over the plants just under the ground; and never, in our previous experience, have we seen anything like the amount of destruction done, nor such quantities of wheat ploughed down." The wireworm is an easily discerned, stiff, wiry, orange-coloured larva, which usually attacks corn, and most other of our cultivated plants, by eating into them, and leaving its tail-end rigidly projecting at nearly right angles. Careless observers often, however, confound it with grubs and other larvæ, and even with the centipedes, so that it is blamed for much more than it really deserves, although its destruction of crops is sometimes not easily over-estimated, more especially where the land has been recently broken up from old pasture. But it has little or almost nothing to do with the present loss of the wheat crop, which is attributable to a very different insect, the larva of which is much softer, as well as shorter, proportionably thicker, lighter yellow in colour, and is invariably found within, instead of occasionally projecting from, the plant upon which it feeds. Its entire length is about three-tenths of an inch; in form it is thickest at the tail end, and tapers gradually towards the head, where a small longitudinal blackish internal portion, apparently the mouth and throat, is seen through its transparent surroundings, and the extremity of which presents a forked hook-like appearance when protruded in the act of feeding. It belongs to the footless section of grubs, but progresses pretty actively when laid on a flat surface, by means of the contraction and expansion of its ring-like segments, which appear to be about ten in number, but are not easily defined even by the aid of a pocket microscope. At first, from one to three, but most frequently only one young grub may be seen just within the neck of a wheat plant, or immediately below where the leaves open or spread out; from whence it eats downwards, devouring the tender inner leaves, the tops of which then become withered, followed by the others, as the grub progresses and attains to full size, at which stage it has generally reached near or close to the upper roots of the plant, and then changes into its chrysalis form, which is a little shorter as well as thicker than that of the grub, and of a dull orange colour. This is the stage of existence to which the grubs of the present season have very recently attained, and at which they may be gathered in or near to the remains of the plants on which they have fed. We defer further description for the present, as entomologists have not yet furnished reliable data in regard to the after transformative habits and reproduction, or are even agreed as to the name of this most unwelcome visitant. As, however, such knowledge is most essential, in order to guide cultivators in discovering modes for successfully contending with and overcoming this minute scourge, we hope that many of our readers will assist us in taking up and thoroughly exhausting the subject; and thus by commencing immediately with the insect in either its grub or chrysalis stages, noting the time and manner of its change from the latter into the fly state, and here carefully distinguishing between the flies which cause the mischief and their destroying ichneumons, both of which will in all likelihood proceed from different chrysalæ of the destroying grub. Then comes the manner of their reproduction, as, whether the eggs are deposited on any part of the wheat or other plants, or in the earth. Whether or not another brood will be hatched in course of the present summer; and if so, when, how, and where are the grubs fed—how affected by insect enemies and icissitudes of the weather, their after changes or transformations? And in particular, how he insect is perpetuated or preserved throughout the winter, until again seen as a young wheat destroyer in early spring?

As regards the ravages of this wheat grub n the present season, although they are very widely spread, our worst accounts of its doings have been from the Lothians; and, curious enough, we find in a communication from he late Mr Robert Arthur to the *Gardeners' Chronicle*, June 1, 1844, entitled a "New Cause of Failure in the Wheat Crop," an account of a similar visitation that spring which led to the ploughing down of wheat fields in East Lothian; and in which it is stated that Mr Ross, who was then farm-steward to Mr T. Richardson, Abbey Mains, shewed specimens of the grubs and injured plants to David Low, Esq., professor of agriculture in the Edinburgh University, and others, "who looked upon them as new evils on the farmers of this country." In a paper which was read by William Markwick, Esq., F.L.S., before the Linnean Society on the 1st of November 1791, he alluded to several fields of wheat in the neighbourhood of Battle which appeared much blighted in the previous spring, caused by a small caterpillar or grub, lodged in the centre or heart of the stem just above the root. The unprecedented abundance of this destroyer in the wheat of this season has led many to look upon it as a new scourge; but the above notices confirm the more reliable opinion that it is a visitant of old standing, which, like other vegetable-devouring insects, appears occasionally in disastrous numbers, becoming again comparatively scarce and harmless, or almost entirely disappearing, in consequence of some unknown climatic or other unknown causes, which, were they only properly investigated and understood, might be turned to good account by cultivators.

As to the late extensive ploughing down of wheat, there appears good cause for belief that it has been overdone. Often farmers may be heard to boast of having recovered seemingly much destroyed or very thin crops by top-dressing, harrowing, and rolling, all of which operations may be beneficial. But a careful inspection would generally, and in the present case most assuredly, shew that the destruction and thinness were more apparent than real; for going into fields lately, where large portions appeared bare, or presented only the withering remains of plants, and drawing off an inch or so of the surface soil, many of the eaten-down stocks were seen pushing out young shoots, which have now sprung up vigorously, and are now re-covering the ground with vigorously advancing verdure. Observing corn growers are aware that plants of wheat, barley, oats, and rye, have two sets of roots; the first of which are produced before the young leaf appears, and remain in close proximity to the seed; while the second is produced at a greater or less distance above the first, according to the depth at which the seed may have been buried in the earth. These first or seminal roots contribute comparatively little after support to the plant, as may be seen by their diminutive growth, as well as by the much thinner stem between them, than the upper, which are termed the coronal or crown roots. Hence it is from these last that the fore-mentioned shoots generally proceed; but such is the vitality of the young wheat plant, that where the crown has been too much weakened or eaten into by the grub, one to three young shoots may frequently be seen to proceed from the lower roots; while from the upper, when their crown is sound, from five to seven is a very usual number.

NEW FARM CROPS—SUGAR BEET.

IN sowing the seed, as we do mangold wurtzel, at once in the soil, not raising the crop from transplanted plants, the three usual modes open to us are, broadcasting, drilling, and dibbling. Of these, the dibbling is the best, broadcasting the worst; the latter, indeed, should never be practised when good crops are desired. Dibbling is done either on the ridge or upon the flat; the flat system is considered the best. One great advantage of the ridge system is the ease with which the dibblers perform their work compared with that on the flat, as the lines are marked out, and they have simply to keep the top of the ridge. If the flat system is adopted, in the absence of a dibbling machine—yet to be invented—it will be necessary to have some contrivance for marking out the lines upon the surface of the land, which the dibblers have to follow in putting in the seeds. The simplest contrivance is a batten some four or five feet long, with pins projecting from its under surface, the distance between which should be equal to the required distance between the lines. A handle should be attached by which to draw this simple implement across the field. The seed holes are dibbled either singly by hand, or by a dibbler which makes five holes at a time. This is composed of a piece of timber with projecting pins on its face, the length of the pins being equal to the depth to which the dibble holes are wished; a vertical stave is firmly fixed to the centre of this, and provided with a cross handle. The holes can be dibbled with great rapidity with this implement.

The seeds, three or four in number, should be dropped carefully into the dibbled hole, and covered up with the soil, which should be pressed firmly down upon the seed with the foot. Or a small roller may be drawn along the lines covering the seed, compressing the soil at the same time. The dibbling and the drilling systems—in the latter the seed being sown, it is almost needless to say, in continuous line—have each their advocates. The drilling is no doubt quicker done, but the quantity of seed required is greater than where dibbling is performed, and the thinning out of the plants is a more tedious operation. Taking all things into consideration, the dibbling is the most economical, in the sense of its giving ultimately the largest crop.

When the plants, either in the dibbled or drilled system are well up, the thinning should be carried out. Where the seed has been drilled, the thinning is performed like that of the turnip, by means of the hand hoe, the distances between the plants left in, being regulated according to circumstances, and as desired. Where dibbling has been done, all the plants in the dibble hole have to be removed, excepting one—that should be the strongest of the lot. As a rule, the thinning of all root crops is very carelessly done, at all events it is not done with the attention which the operation requires. It is not too much to say that the success of the crop depends upon the thinning being properly done. Each plant should be left in the soil, not loosely, half out and half in, as is often the case, but it should be left firmly embraced by the soil. The plants, moreover, should, as stated above, be the strongest; a little attention will shew that in all clumps of plants there is one stronger and finer than the others, —that is the one which should be left. If the thinning is badly done, and the plant left loosely in the soil, the chances are that it will droop, if not die, especially if the weather is windy; whereas, if well embraced by the soil, it will more quickly take root and advance. The case will be worse, however, if two plants or more be left in the soil; here the chances all are that the plants which grow will be abnormal in their form, stunted, and sickly. For it may be taken as a rule, which, however, is too frequently overlooked, that each plant, to have justice done to it, should have its own soil free in which to de-itself. All this points to care being taken e thinning of the plants—care which ins much labour, and which labour some say, and do indeed say, does not pay; as ich, all that we have to say is this, that if es not pay to grow crops in the best it will not pay to grow them in the . The thinning being well done, and lants fairly taken to the soil, the afterre may be comprised in the one sentence, hoeing and stirring the soil, and clearing it of weeds.

In the growth of beet for sugar-making purposes, large roots are not aimed at; small, or, at all events, not very large, roots affording a larger per-centage of sugar than very large roots. In round numbers, it may be stated that it takes three times more of large roots to yield the same amount of sugar that small roots give.

TEAM CULTIVATION ON MAJOR STAPYLTON'S ESTATE OF WASS.

a former number of this MAGAZINE we gave an account of the introduction of am-plough on the estate of Wass, in the h Riding of Yorkshire, the property of or Stapylton. This plough has now had ir trial, and having been provided with particulars as to what it has accomied, we propose once more to draw the ition of our readers to the subject. The ne is one of Howard's *new traction and ghing engines*, and was got with the view cipally of breaking up, for cultivation, it 90 acres of moorland, situated on an ation some 900 feet above sea-level, on Hambleton range of hills. The specific acter of the soil is a sandy loam, lying on rd irony substance, some 8 inches below surface. The ground is undulating. re the introduction of steam, horse-power attempted, but this was found quite inquate for the purpose of breaking up the sufficiently, as the plough and cultivator l, even with four horses, could not get w the hard *pan*, and consequently acted shovelling over grain on a barn floor; des, the cost by this means was found to ally 20s. per acre. The steam-plough, ever, has been found to work well; inl, much better than was anticipated, not in the efficacy of the work, but also in ost per acre. The *cultivator* breaks up *pan* most admirably, thus rendering the soil below available to the roots of the plants of future crops. The plough afterwards turns over the soil to a depth of 15 inches, and this too with considerable ease.

The following are the *daily* items of expense connected with this steam-plough:—

Interest on outlay	£0	2	6
Tear and wear	0	4	0
Engineman	0	3	0
Cultivatorman	0	2	6
Anchorman	0	2	6
Porterman	0	2	6
Boy attending at engine	0	1	4
Man and horse driving coals and water	0	5	0
Price of 6 cwt. of coals, at 8d. per cwt.	0	4	0
Oil, grease, cotton-waste, &c.	0	1	0
	£1	8	4

Here, then, we have a sum of 28s. 4d., representing the whole expense of a day's work of this steam-plough, and this, divided by six, which represents the number of acres ploughed in one day, makes the cost of ploughing each acre of this moorland only 4s. 8½d. fully. This sum, put against that required to plough the land by horse-power, will, we doubt not, convince those who say that steam-cultivation does not pay, that it really does pay. At this rate, the whole cost of ploughing the 90 acres by steam will cost say £21, while to have done so by horse-power would, we have seen, have cost £90, thus making a difference in favour of steam by £69, on this small piece of work. These figures are actual facts.

CATTLE AND SHEEP IN NEW SOUTH WALES.

WE extract the following interesting particulars from the chief inspector of stock in this colony, Mr Alexander Bruce :—

NUMBER OF SHEEP.

The numbers on the 1st January, in each year, were as follows:—1861, 6,119,163; 1862, 6,550,896; 1863, 7,169,926; 1864, 9,089,463; 1865, 9,650,106; 1866, 11,644,593; 1867, 15,066,377; 1868, 16,000,000; 1869, 16,848,217.

The loss by drought in 1869 was upwards of 1,000,000. The lambing, however, has been favourable.

IMPROVEMENT OF THE SHEEP.

Considerable improvement is taking place in the quality of the sheep, by culling, and the introduction of a better class of rams into the flocks; but a great deal has yet to be done in both respects, and good rams are comparatively scarce. This is especially the case with respect to the south-western portion of the colony, where owners were accustomed some years ago to obtain their stud sheep from Victoria. Now, however, through the infected state of the flocks in that colony, this source of supply is stopped, unless by way of Sydney, and the expense and trouble of introducing them in that way is too great to be generally adopted. Owners are, therefore, as a rule, obliged to purchase their rams in this colony, and as the breeders have also to supply many of the flock-owners in Queensland with stud sheep, the supply of first-class stud sheep is not equal to the demand.

THE CLIP.

The clip has upon the whole been a good one, though there are complaints from some quarters that the staple is not so sound as might have been wished. This, of course, is also attributable to the drought.

A very decided improvement is this year observable in the getting up of the clip, both through water being more plentiful and through improved modes of washing being adopted. Large sums have been expended on many of the stations in machinery for hot-water washing; and although this mode has been unsuccessful in some few cases, through mismanagement, there is no doubt that it will eventually supersede the cold-water system.

More care has also been exercised in the sorting and packing of the wool; and it is to be hoped that this is the commencement of decided annual improvement of the clip shipped from this colony for the London market.

SCAB.

Now that the colony is entirely free from this disease, the closest vigilance will be exercised at all the ports to which there is any probability of imported sheep being brought. In order also, as far as possible, to remove the risk of infected sheep being brought into our ports by vessels from Great Britain, it has been suggested to their captains, through the agents here, to have their "ships'" sheep inspected before they are taken on board, as, in nine cases out of ten, the infection among imported stud sheep is traceable to "ships'" sheep.

Our flocks have been and still are subjected to very great risk from the infected state of the sheep in Victoria. There they are all running at large, and liable at any time on the Upper Murray portion of the colony, and during the summer season, along the whole border, to cross the river. Numbers of Victorian sheep have found their way to this side, and been destroyed by the boundary riders now patrolling the northern bank; and it is only by the vigilance of these riders, and the constant care and energy of the Border inspectors, ably supported as they have been by their directors, that our flocks have been kept free from infection. Besides the risk, the infected state of the Victorian sheep thus entails a heavy expense on this colony. There v nine riders patrolling the northern f the Murray, and as the river becomes :here will no doubt be demands for

It is to be hoped, therefore, for the f both colonies, that the New Scab hich was lately before the Victorian ient, will shortly become law, and that rove a thoroughly efficient measure. troduction of sheep from Victoria, ex- ' sea, is of course strictly prohibited by nation.

ı fresh outbreak of scab recently oc- in South Australia, the sheep from lony were interdicted from entering the 8th October last, and the inter- ll remain till it is certain that all the l sheep in that colony are securely tined, and that no infection exists ex- n the south-eastern portion of the

NUMBER OF CATTLE.

number of cattle in the colony during /eral years from 1st January 1861 to uary 1868 inclusive, are stated in the *cal Register* as follows :—

t January	1861	2,271,923
,,	1862	2,620,383
,,	1863	2,032,522
,,	1864	1,924,119
,,	1865	1,961,905
,,	1866	1,771,809
,,	1867	1,728,427
,,	1868	1,761,411

Bruce states that the principal cause was pleuro-pneumonia and the dila- ; of owners in adopting inoculation. following remarks we quote in full :—

MEAT-PRESERVING COMPANY.

establishment of a meat-preserving ıy is also urgently called for in Sydney; il central markets are established, and osal of the stock placed upon a more ory footing than it now is, it would be · possible for such a company to carry operations with success. The estab- t of a meat-preserving company would ly advantageous, both to stockowners and the colony generally; for so soon as it was fairly in operation, stock must rise to Melbourne prices, and the preparing and shipping of the meat would add considerably to our trade. The proof that the prices of stock here would then advance to the Melbourne rate lies in the fact that owners are now sending their cattle from the Castlereagh to Melbourne, where they are largely purchased by the Meat-preserving Company, and at 25 per cent. advance on the Sydney prices. At the same time, although it may appear somewhat anomalous, it is the case that the retail price of meat is no higher in Melbourne than in Sydney.

Mr Bruce concludes his excellent report with the following admirable observations on a most important subject :—

CONVEYANCE OF FAT-STOCK BY RAIL.

Whether our fat-stock travel by the "Bulga," by "Bell's Line," or by the Southern Road, their condition is now greatly deteriorated during the last portion of their journey—a great deal more than is generally imagined. It is a well-ascertained fact that at home a fat beast crawling along a good road at a snail's pace, and rested, and well fed day and night, loses 8 lb. a-day during the journey; and surely here, with bad mountainous roads, little or no feed, and that little exceedingly inferior, and the cattle comparatively wild, we are justified in putting the loss at the same amount in the summer, and one-half more in the winter. It may be that stall-fed cattle when taken on the road would fall off very much, but they cannot possibly do so to the same extent as our cattle in the last 120 or 140 miles of their journey to Sydney by either of the principal droving roads.

If, then, our stock travelled by the road, waste even to the extent that they do at home —and I believe stockowners themselves, when they consider how the cattle die on the station and in Sidney, will allow that I am rather under than over the mark—there cannot be a doubt but it would pay the owner much better to send his stock by railway from any distance over 80 miles than by the road.

The question stands thus on cattle from Goulburn :—

BY RAIL.

Railway charge..............................	£0	8	6
Loss of weight, say one day's waste, at 8 lb., at 2½d. per lb....................	0	1	8
	£0	10	2

BY ROAD.

Droving..	£0	3	6
Waste of condition, say ten days, at 8 lb. per day, = 80 lb., at 2½d.......	0	16	8
General deterioration of quality of meat, say ⅛d. per lb., on 650 lb. =........	0	6	9
	£1	6	11

That is a clear gain of 16s. 9d. per head, exclusive of the advantage of a far quicker return (a matter of very material importance to all, but especially to the dealer), and also that of far less risk of damage or loss than if the flock are sent by the road. The price put on the quantity deficient is not too high, considering that it is the best of the fat that is wasted, and the rate fixed for the general deterioration is considerably under than over the mark.

I believe a good many sheep are now sent by rail to Sydney, and there can be little doubt but all ought to be so when the distance is over thirty or forty miles. It is comparatively little trouble to put them on and off the trucks, even with the present convenience, which might be increased; and they waste as much as cattle on the road in fine weather, and a great deal more in bad. I have it on the very best authority that sheep sent by rail from Goulburn in ordinary weather are worth at least 1s. 6d. a-head more than those travelled by the road. This would bring the saving to be effected by sending cattle by rail to about the same amount as that already estimated.

Were these facts brought prominently before stockowners, and proper accommodation provided for trucking the stock, there is no doubt but the greater part of the cattle and sheep coming to the fat-market would be carried by rail—say from Murrurundi on the Northern Line, from Bathurst and the Mudgee Road Junction on the Western, and from Goulburn on the Southern; and this additional traffic would give a great impulse to railway extension, as the carriage of fat-stock by rail would, even at the present rate of consumption, amount to some £40,000 or £50,000 a-year.

I am aware that the comparative wildness of our cattle-stock and the difficulty of trucking them will be brought forward as objections to sending them by rail; but the fact that cattle are now frequently sent from Sutton Forest to Sydney by train is a sufficient answer to these objections. The arrangements for trucking cattle could, however, be improved, and I will now endeavour to point out how this might be effected.

The present close covers, which frighten the cattle and stop them from going into the trucks, should be removed. The cattle are, of course, wholly unaccustomed to anything of the sort, and the covers have to account for a great deal of the punishment and bruising to which the cattle sent by rail are now subjected. As they will almost always be carried at night, they require no shade from the sun, and they are too closely packed to suffer from cold or wet, even in winter. Should, however, exceptional hot or cold weather occur, iron stays could be thrown across the trucks, and tarpaulins tied over the stays. Besides the side-doors in the truck (which would be required for loading goods for the up-country trip), there should be one at each end, the whole width of it, but divided into two halves, so that when they opened and swung back on the sides they would fill up the gap between the trucks caused by the buffers.

The yards and line should be constructed as to place the trucks when loading end on to the yards. The proper number of trucks, according to the size of the mob of cattle to be despatched, could then be drawn up to the yards in a continuous line and firmly chained up to each other, while a piece of flooring, made for the purpose, could be placed between each truck over the buffers, and so secured by bolts, or otherwise, to the two carriages and to the buffers as to carry the cattle steadily over them. On this being done, the half-doors could be thrown back at each side d fastened by strong chains or iron bolts ı the side, to secure them against the pressre of the cattle. The trucks would thus rm an unbroken line from end to end; and the engine were kept at a distance, and the heels of the truck as much as possible out f sight, there is no doubt but, with a few uiet workers or milkers to lead them on, the attle would take the trucks nearly as readily s they would a line in a stock-yard, and more eadily than they crossed some of the bridges n their road to the station, for at the station he forcing-yard would of course assist in naking the cattle go into the truck. As the attle went on the trucks they could be kept rom going either backward or forward by utting round rails through here and there, where required, between the rails of the rucks or through openings made in the sides for the purpose, till each of the trucks could be filled with the proper complement of cattle, and the doors closed and fastened.

In this way I think it will be seen that the whole number of trucks would be more easily loaded than one would now be with the cover on it, and by the small door in the side; and the cattle need not be knocked about or bruised more than they would be in putting them into a drafting-yard or lane. The sides of the trucks should be closely and smoothly boarded all round, from the height of say 4½ or 5 feet down to a level with the animal's knees, to prevent bruising through the one beast crushing the other, and the inside of the fore and hind doors should be padded, to save the cattle from the effects of the jolting occasioned by the train.

With these precautions, well planned forcing yards, and quiet careful management in putting on and taking off the cattle, they ought to have fewer bruises upon them than if they had come through some of the double lines of fences between which they would have had to travel if they came by the road; and the saving in condition by the rail has been already pointed out.

Some of the details of the plan which is here sketched may no doubt be susceptible of improvement; but any one who has had to do with the working of cattle knows that the principle of having one filling up is the right one, as it not only saves time and labour, but also the condition of the cattle. In working cattle in a yard, whether it be merely drafting them, or inoculating, or spaying, the "filling up" occupies a very large share of the time.

Closely connected with this subject is that of the Central Cattle-yards; and the carriage of the fat-stock by rail will tend to remove one of the chief difficulties with which that question seems at present beset—the providing of sufficient paddock accommodation near the sale-yards, if they are brought near enough to Sydney to suit the convenience of the retail butchers. For when stock are brought down by rail, the principal waiting paddocks will be situated near the up-country termini of the different lines; and with stock thus within eight or ten hours' journey of the market, and the telegraph at less than half-an-hour's ride of the drover, a large over-supply of stock will seldom be yarded, and extensive paddock accommodation near the sale-yards will, under these circumstances, be unnecessary.—*Alex. Bruce.*

TRANSIT OF STOCK.

THE latest regulations of the Privy Council relating to the transmission of stock by sea and land, if properly acted up to, will conduce to the comfort of the poor animals considerably. The rules insist that, on and after the 31st July, every vessel carrying stock shall be substantially divided into pens; that no one division shall be more than 9 feet in breadth by 15 feet in length; that proper footholds shall be fixed in the pens, and means of ventilation provided in all weathers. So far so good, but it may be doubted whether, in what may be described as very moderately stormy weather in the North Sea, animals will not be injured unless they have each separate stalls. Like human beings, animals are of different constitutions and of different strengths, and unless protected by partitions, the sick and the weakly are almost sure to sustain injury from the pushing and the trampling of their more robust neighbours. The regulations also properly provide that for six months in the year, from November 1st to the 30th April following, no freshly-shorn sheep shall be carried on the deck of a vessel; and they likewise insist that gangways must be placed either above or between the pens in which the "woolly people" are carried. Every one who has been on board a vessel with sheep will recognize the necessity and humanity of such a provision, as every one with kindly feeling must have been shocked at heart to see the cruel way in which the sailors often pass over and among [illegible] flocks on deck. If [illegible] regulations [illegible] not complied with, the [illegible] vessel can [illegible] sion of the commissioner [illegible] until the Privy Council shall direct [illegible] what is to be done with them. Although not explicitly stated, we presume the burden of the loss would fall upon the owners of the vessel, as we take it for granted that the proprietors of the stock can raise an action of damages again shipping companies for any detention a terioration caused by negligence of the This right of detention, vested in an i tor appointed by the Privy Council, into force after 31st October.

Provision is made, under penalties, thorough cleansing and disinfecting vessels carrying live animals. Water m provided to stock gratuitously at all pl lading and unshipping, at the request person in charge. The unshipment m managed speedily and conveniently food must be supplied to the stock, manded, at a price to be approved the Privy Council.

With regard to conveyance of sto railways, the rules concerning cleansin disinfecting are of a nature similar to that apply in the case of steamers. first of next year every truck must have buffers, so as to reduce the liability animals being shaken and injured by ing, and the floors of the waggons mus proper footholds. After the 30th of month care must be taken, under fin there is no over-crowding in the truck all shorn sheep, from November to must have covered waggons, or be cl unless, indeed, they have been clipped days before the date of their journey. the orders make carriers and consign stock contravening them alike liable.

We are not quite sure, however, th regulations are clear enough about the s of water to stock conveyed upon rail They certainly enact that the "railways at each of their respective stations, have for animals carried, or about to be, or h been carried, on the railway of the comp but, then, how is that water to be conven supplied to animals in transition on journeys? This is what we should li have explained, as the point is of the u importance.

THE SEWAGE QUESTION.

HAT is to be the result of all the discussion about the Sewage Question? to have piles upon piles of blue books tingly containing Commissioners' Re- without some corresponding action aken ? Is all the evidence that has icited as to the practicability or im- ability of the various schemes to go for ? To be sure the Government are heavily weighted with measures of nportance, and at best, the powers of e finite. But can the people do no- r themselves ? Are the rivers and the that intersect our island to become engers of teeming populations ? Are nd comfort to be sacrificed with im- Corporations of large towns, and sioners of smaller ones, if not exactly on complacently, may, to all intents poses, be doing so. Great sums of are spent in carrying out so-called drainage schemes, without that re- r the economic utilization of the that passes through the system. om that altogether, which is much the matter of the two, the atmosphere ned with the pestilential vapours end on the return of heat from every d stream upon which any town or is situated. The practice seems too be based upon the plan of getting st riddance of excreta possible. So water-closets do effective duty, and rities are carried away from the pre- a sufficient flushing of water by n, so long will placidity and con- shine in the faces of certain imper- corporations. There may be an l growl when coming in contact with hbouring stream, but it soon dies It seldom takes sufficient root to nergy and action at the Council "The people may rage," but their atives evidently set them down in minds "as imagining vain things."

A valuable article of commerce is being destroyed. The money spent in forming a system to carry it off upon the out-of-sight principle, would go far to establish a system of another kind, whereby its manurial value could be tested, and some substantial return made to the producers. With the evidence we have before us, of what has been done and is doing with a portion of the London sewage at Barking, with the sewage at Aldershot, at Rugby, and at Craigentinny, near Edinburgh, agriculturally speaking, we are immensely interested in other large towns following the example.

There are difficulties to encounter, but they are not insurmountable. Large centres of population are large producers, and the difficulty of distributing the sewage on convenient localities is quite obvious. But even that can be overcome by a chemical process; the sewage can be deodorized and concentrated, and conveyed by our railway and river arteries to any distance. Its productive value is no doubt impaired; but, notwithstanding, it is a valuable manurial agent. Then the streams and rivers are unpolluted, which is a sanitary gain of the first importance, commending itself to every one connected with the health and well-being of large populations.

There is no system, however, half so satisfactory, either to the agriculturist or the cityman, as the gravitation system. There is no carrier half so valuable or so efficient as water, and if it be possible to divert it in any way, by pumping or otherwise, to flush the sewage to the fields, it ought to be done. The little town of Rugby has shewn a spirited example, which Manchester, Liverpool, and Glasgow, would do well to follow. According to the Commissioners' Report, the authorities have laid out nearly £5000 on the works for the distribution of the sewage, forming a deep and costly tunnel drain, through which the waste of the lower part of the town is made to flow. Difficulties, therefore, are made to vanish when determination, and skill, and assiduity are put to the test.

There is not a single town in England where a nuisance of this kind exists, that could not be operated upon to rid the inhabitants of its offensiveness without inflicting upon them additional burdens by the tax assessors. As an instance of how the practical difficulty of carrying from a low to a higher level is surmounted, let us cite the case of Banbury, with its population of 11,000 inhabitants. There the sewage is all drained into tanks. From these tanks, by steam application, some 300,000 gallons a-day are forced to irrigate the farm, which produces a succession of crops of Italian rye-grass, bringing from £3 to £5 per cutting. Owing to the scarcity of water for flushing purposes, the sediment in these tanks is something very considerable; but that, again, is utilized with scavenging refuse, and sold at a price. That is by no means a new principle. It has been adopted in Flanders long since. The Flemish authorities combine with the farmers of the district, and present an article of commerce, which is as anxiously sought after, for productive purposes on the farm, as it would be in this country if prepared as a marketable commodity. While some little towns have been working out the theory of sanitary reform, upon something like a remunerative basis, the big towns are content, in the midst of their dirt and filthiness, to remain inactive. They look for help outside altogether of themselves. Agriculturists are ready to avail themselves of this manure in any of its forms, only they expect the producers of it to present it to them in marketable form. It is not their place nor province to step inside of the city boundaries and organize a scheme for collecting it. The doing of that is purely a sanitary piece of business. Their fields, however, are ready for receiving it, and there will be no difficulty about the business arrangement. The field is infinitely the best deodorizer, and should be the first outfall considered in any scheme. Heat aggravates offensiveness of sewage, even when diluted with water, therefore, rivers and streams should not be called upon to do all the scavenging work. By all means accept their good offices as carriers and cleansers. They will do admirable duty in discharging the load of filth piecemeal over lands upon which they are made to travel. The filtration going on, supposing a river or stream to be diverted from its source, is nearly as perfect as supposing it had not been diverted at all. Scarcely any Board of Health understands or appreciates this, and their deliberations and doings are consequently in any direction but the right one. This accounts for much of the inertness that is conspicuous by its presence in such large towns as we have named above. They seem "to labour and to wait" quite in the wrong direction. All their labour is in getting up elaborate scientific disquisitions on the best modes of approaching the question. All their waiting is for a better and a cheaper method than what the best authorities have advised. Were their labour to be expended in taking a leaf out of the book of those that have successfully practised sanitary reform, their waiting would be only to see such results as would add to the comfort and reduce the death-rate of the population.

PULSE CROPS.

: are no crops so precarious as beans eas. It is scarcely going too far to › crops out of three are comparative :any crops turn out altogether value- is much more the exception than the :r beans or peas to turn out full crops. 'ery stiffest description of clay soils long held a constant place in the ro- ›pping ; and on some light soils peas ntly been planted as a sort of chance v the cereals to fit in in regular order. e introduction of clover and root natural enough to have recourse to change for the soil, especially when vere more certain than they are now ; t is universally acknowledged that are so very precarious, it is the more t root crops or clover do not take, ntly at least, the place of beans and

true that both roots and clover fail t certainly not so frequently nor to :nt as pulse. About one year out of iave almost entirely failed ; but man- oes, cabbage, &c., never all in any utterly failed, nor have clover and seeds come to nothing near so fre- pulse. The chances are, therefore, our of having either root, clover, or instead of pulse.

· mixed grass crops, are the least ex- ıll to grow. There is only the mere . and the making of the hay, which ırcely amounts to a pound an acre. o expense whatever for cultivation. ›f manuring beans and root crops be for all, the other expenses connected or peas amount to as much as for To exclude rent and manure, and nparative cost of both crops in a n, the result will be more easily

PULSE CROP PER ACRE, EXCLUDING RENT AND MANURE.

....	£0	10	0
:ed, average price, 5s...........	1	0	0
lrilling, harrowing, &c.........	0	6	0
›eings..............................	0	8	0
›eings	0	2	0
....	0	10	0
ıck, 1s. 6d.; thatching, 1s......	0	2	6
c., if any crop.....................	0	4	6
Total...............................	£3	3	0

COST OF A ROOT CROP PER ACRE, ON CLEAN LAND.

One autumn or winter ploughing in dung...	£0	10	0
Two scarifyings, three harrowings, and one rolling, if necessary..........................	0	4	0
Seed and sowing..................................	0	4	0
Singling and other hoeings.....................	0	10	0
Getting up crop....................................	0	6	0
Leaving a balance of 29s. for extra manure or carting the crop from the field to make the cost equal to a crop of beans..........	1	9	0
	£3	3	0

It is, of course, perfectly easy to make the balance of cost of either crop turn any way, and bring forward many exceptions to the approximation given. For instance, the bean crop may sometimes cost a few shillings less per acre for seed and hoeing ; and the root crop almost invariably costs more than is shewn. On the other hand, beans sometimes cost much more also for cultivation, whilst the extra cost of growing roots might be very much swelled up by charging manure, a number of ploughings, and the cleaning of the land.

It seems, however, quite a mistake to debit a root crop with the entire cost of manuring, and cleaning the land, when these operations have, or should have, at least a great deal of credit as contributing to the success of all the other crops in a rotation. The land must be kept clean by some means ; it must also be manured. It is so usual to debit a root crop with both the manure and also with any amount of cleaning the land may require, that the total expense of producing a green crop under such circumstances may be very great, and contrasts most unfavourably with the small expense of producing any other crops, which are neither debited with expensive cultivation nor manure.

On all ordinary soils, manure of some kind is absolutely necessary to produce good crops ; not necessarily applied for every crop, but in large or smaller quantities at stated intervals. Beans, or any cereal crop, may succeed very well on land in good condition—in condition by what? why, of course, by previous manuring. Then, why not debit every crop with a certain cost for manure as well as for cleaning? It sometimes happens that there is no cost whatever for cleaning the land for root crops. We have now 30 acres dunged and ploughed, which require no cleaning, the previous corn crops having been kept clean by forking out any bits of cutch which appeared before and during the growth of the corn. The expense of producing root crops on clean land, dunged and ploughed in autumn or dry winter weather, is very low in comparison with the cost of growing any corn crop, as the matter of a few shillings for seed is so much less than the usual cost of seed beans or any other corn crop.

Beans are called a cleansing crop, or unfrequently allowed to assume the name of a fallow crop; but it is much more usual for the land to be fouler after the crop is reaped than before it was sown. Annuals, of course, may be kept down in pulse crops, but cutch never can to any great extent be destroyed, or the corn must be sacrificed. Annuals, indeed, are much too frequently allowed to shew themselves in greater force, and come to seed in beans than in any other crop whatever. Unless by early and frequent hoeing charlock cannot be kept down, it is seldom subdued. When old it becomes too tough for hoeing, and there is no means of destroying it but pulling, which is so difficult to accomplish during a busy season, that the weeds are allowed to come to seed to the injury of many future crops.

It may not be too much to say that one crop—one pulse crop out of ten—has no right to be classed with cleansing crops. It can, therefore, take no credit as regards the cereal crops in a rotation. It may fairly enough be put down as a makeshift merely, doing no good, but harm more generally, to the land, besides the great drawback of seldom covering the expense of cultivation.

In the midland counties of England during the last twenty years, we do not think the value of pulse crops has averaged £4 per acre. A large crop is quite an exception, utter failures much more common. So generally valueless have pulse crops been lately, that the land would have been much better in naked summer fallow. Seed sowing, hoeing, and harvesting, little else but straw would have been saved, besides having the great advantage of thoroughly cleaning and airing the soil for succeeding cro most stiff soils a thorough clean fallow paration and starting point for cere clover, is so valuable as not to be compa a few bushels, or even a few quarters o obtained at a great cost.

A bare summer fallow is never, necessary with anything like good far simply cleaning the land. All but th land in a very wet season may not cleaned but cropped with roots of son There is, therefore, the double advar cleaning the land and obtaining a cro set against a generally poor bean cro likely to make the land fouler rather tha

Although Swedes have occasionall and other green crops also, there has ne such a total failure of all kinds but th portion of a crop has been saved. Fa root crops may frequently have result unsuitable management—the land n enough worked, or otherwise imprope pared. If once roots get a fair start little risk of the crop. With beans th otherwise. The failures usually happe blossoming time, by atmospheric cause no human power can avert.

Turnip and mangold crops vary much according to season and management. perience of the average value of root c acre, estimated as food and manure, i thing from 6 to 10 lb., which is about do value of average pulse crops. There ar who, no doubt, on good bean soils, ha this crop more valuable than our estim may at the same time have estimated of growing root crops much higher, by manure, cleaning, and otherwise, work land. We have, however, ceased to gro crops when they can be at all avoided, stitute either clover, mixed seed, or gree for them, with a decided advantage. E should reason fairly according to circum and act accordingly.—*R. V. in Bells Messenger.*

IFICIAL AND COMMERCIAL VALUE OF ARTIFICIAL MANURES.

BY DR VOELCKER, LONDON.

erbyshire Agricultural Society (said oelcker, by way of introduction) was the right direction, and he could imself the pleasure of congratulat- irman and members of the Society eep interest they had manifested in cheese factories in Derbyshire, rtaking he believed bore with it all s of success ; and he must also con- em upon being the first to introduce ment which would materially influ- ly, and he hoped economically, the he country. The cheese movement t importance to agriculture through- l, and he had been delighted to find naking the first attempt to success- ut what he recommended ten years troduction of the "Cheddar" plan of ing cheese ; and he could not doubt vere successful, small cheese factories pringing up throughout the length of the dairying districts of England.

ARTIFICIAL MANURES.

ect was annually gaining in import- ereas five or ten years ago men spent ely little in the purchase of this manu- a large and growing demand was the agriculturist desired to keep up ies, and successfully farm his country, necessity purchase a large quantity manures, for in the present state of fertilizing matter was needed on the uld be obtained by natural manures. as a great amount of money had to by the farmer in this manufacture, it greatest importance that he should wledge of the fertilizing constituents red into the composition of those ich were offered to him for sale. It much by cooking or turning it over, corporation of the right materials in nds which were sold in the name of hat they obtained manures of high uality. There was a time when the n had a mistaken notion with regard rd manure—that if they turned it times it would become improved. If it over twice and made it rotten, it went further than fresh manure; but at the same time it lost by this process a great amount of its fertilizing influence, and the most economic plan was to cart it to the field as soon as possible. He then referred to the value of ordinary manure, which depended very much upon the things to which it was composed.

SEWAGE.

Manure, like sewage, contained very little fertilizing matter, for in the solid deposit they would find a great deal of matter, which was found in every kind of soil, clay, lime, sand, and some organic matter of no very high scale, and they must not expect in sifting out a solid portion of sewage to find a manure of high fertilizing value. But the case would be very different if they manufactured a manure in which was incorporated a large amount of Peruvian guano, or bone dust; or manufactured a manure into the composition of which nitrate of soda entered largely.

NITROGEN.

The most valuable nitrogenous matters were animal, such as blood, flesh, skin refuse, and hair refuse, which contained a large portion of nitrogen; dry flesh containing nearly as much nitrogen as Peruvian guano, and blood about the same quantity. There were also hydrates and ammoniacal matters, two substances containing nitrogen in combination with hydrogen.

PHOSPHOROUS.

Next in value to nitrogenous compounds were phosphoric acid and phosphate of lime; and thirdly, they had salts of potash, the chief constituents of artificial manures; and the more the manure contained of phosphate of lime and potash salts, the better it was for general purposes.

LIME.

Gypsum and lime produced excellent effects on pasture and arable land, and it answered infinitely better to lime it than to buy the lime at its present high price in the shape of artificial manure.

SALT.

Common salt was another fertilizer, mixtures of lime and salt having done wonders in improving poor pastures. He knew many pastures which had been renovated by good dressing, say 6 tons of lime to 3 of salt, which made an excellent compound for the purpose. And then he would notice the constituents that were not present at all, or present in artificial manures only to such an extent as to be scarcely perceptible. They did not require vegetable matter in the shape of peat, sawdust, rotten straw, or similar cheap materials, which he was sorry to say sometimes were found to a large extent in artificial manures. Sand was another thing of which they should have as small a proportion as it was possible to obtain. Many of the best descriptions of manure, however, contained a certain proportion of sand; and hence they must expect some small portion of siliceous matter in all artificial manures. Thus the value of artificial manures mainly depends on their chemical compounds, and thus far their value can be ascertained by analysis; and by this could be found the true monetary and practical value of manures.

NITRATE OF SODA.

In certain combinations, nitrogen acted much more rapidly on vegetation than in others; and nitrate of soda, when properly washed into the soil, shewed its effect in a few days by a deeper colour and healthier appearance of the grass to which it might have been applied. In dry weather it did not display this action, and was rather a dangerous substance to use, except in very showery weather, especially in top-dressing, because it was apt to burn up vegetation; it was a quick acting manure, and soon parted from the soil. In the shape of ammonia or ammoniacal salts, the compounds of ammonia with acids, they had nitrogen, not quite so active as in the shape of nitrates, so that they could be applied without risking any of those manuring qualities essentially constituent of ammoniacal salts. It was a remarkable fact that the land possessed the power of laying hold of ammonia that it might be presented to the, land in the shape of ammoniacal salt, but had not the power of absorbing nitric acid, which passed through, whilst ammonia remained in the land. His own idea was, that ammoniacal salts ere the second stage in which nitrogenous matter was presented to the plants, an intermediate stage between the crude fertilizing maerial, such as was found in fresh manure or in dried bones or flesh. The soil laid hold of nmonia, and by degrees converted it, during he winter months, into nitric acid, and he believed it was the form in which nitrogen was aken up by the crops. This was the natural provision made by nature that nothing should be lost. It would not do to apply fresh manure in spring, for it would have little effect; rotten dung would answer much better. In considering the value of artificial manures, they had not merely to regard the materials which entered into its composition, but they had also to look to the forms in which materials existed in the manure. It made all the difference whether the nitrogen was present in the manure in the form of nitrate of soda, Peruvian guano, dried blood, shoddy, or wool refuse, which required a long time before it came into action, and was so impregnated with fatty matter that decomposition was prevented, and thus it was deteriorated in value. Then, with regard to leather, an extreme case, he mentioned the inefficient state in which hydrogen existed in it, and that when reduced to finest powder the hydrogen still remained inactive.

CONDITION OF MANURE.

He must also allude to the dry or wet condition of manure; its finely powdered or limy condition influenced the value, and it was unfair not to pay more for light and powdered manure than for one which clogged when handled. It repaid the farmer to pay 7s. 6d. or 10s. for a fine-conditioned article, and he could not expect to get a good manure at a much less price. He would observe that the practical value of artificial manure depended very much upon the good or bad use which the farmer made of the manure he purchased. It was quite possible he might buy an excellent article and yet not make good use of it. Some manures were well adapted for one kind of land and others for another description; and the character of the land, in a great measure, influenced the practical value of the manure; as also did the requirements of the plants and crops themselves.

FARM-YARD.

From experiments he had made in various parts of England, he had come to the conclusion that the most economic and the most efficient manure which could be applied to grass land was that from the farm-yard. Unfortunately, however, there was not a sufficient supply. The question was, what was the farmer to do who had not sufficient manure to put on his grass land? If he were to leave it without manure, his crop would gradually become less and less, and he would become poorer and poorer. The fact was, that grass had not been treated with sufficient liberality, and the ordinary excuse was, that there was not sufficient farm-yard manure to do justice to it. But if they could not get this manure, they could obtain a substitute; and, in the first place, they must take into consideration the character of the land. Then lime it well, and leave it for a couple of years without any manure upon it, as it was not desirable to put lime and manure upon it at the same time, or lime and bones. Bones never acted well on newly-limed land. It was a matter of great importance that he had settled the point whether the land really stood in need of lime or not; very frequently the unhealthy look of the herbage indicated the absence of lime, and if they tested the pasture land in the immediate locality they would find that it stood in need of lime—they ought to give their land a good liming. This was a prominent improvement which must, however, be followed up by other matters.

BONES AND THE VALUE OF EXPERIMENTS.

Then they would have to decide whether bones would suit their land or not. There were no general rules laid down in farming which held good in all circumstances; thus they would find that on some descriptions of land bones had quite a different effect from that on others. He would recommend them to experiment upon half an acre, if they were inclined to apply bone dust to their land, so that if it were not a success they would not suffer serious loss. From his observations he had come to the conclusion that all grass land should contain at any rate a certain proportion of posphoric materials in the shape of bone dust. Light land should be supplied with salts and potash, and all pasture land, which was expected to yield abundantly should be supplied with ammonia and ammoniacal salts. He would also recommend for light land a mixture of manures which were certain to give a favourable return for the outlay expended; and it was also desirable for this class of land to incorporate with manure some potash salt.

POTASH SALT.

Fortunately, potash salt, imported from Germany, could now be obtained, its price varying from £3 to £3, 10s. per ton retail; it was imported into England at £2, 10s.; the importer selling it at £4, which was rather too large a profit. He would recommend for light marly soils, 1 cwt. superphosphate, at £6 per ton, 6s.; 2 cwt. bone dust, 7s. 6d. per cwt., 15s.; 2 cwt. crude potash salts, 4s. per cwt., 8s.; 1½ cwt. guano, £1—the total cost being £2, 10s. 6d. for this mixture; and if they wished to manure their pastures they must make up their minds to spend that amount, or save their money altogether. For light soils he would recommend more superphosphate, say 2 cwt. Peruvian guano, and ¾ of a thousand nitrate of soda, which would make a good dressing for land of a light character. In heavy soils he would take out the potash salts, as they contain a fair proportion of the latter description of red clay, which was invariably such in potash. Ammoniacal salts and nitrates produce bulk, and phosphates and potash, quality; and if both were combined, bulk and improved herbage would be obtained at the same time.

HOW FARMERS ARE VICTIMIZED.

Having made these remarks on the value of manures and offered a few suggestions with respect to the compounds of manures, specially adapted for grass lands, he proceeded to remark upon guano and other manures, shewing that the buyer stood at a great disadvantage on account of having to give the same price for an inferior as well as a superior article, and that great deception was practised by some firms to pass off an inferior article; and he had no hesitation in saying that many of the farmers present had paid far too high a price for their manure this season. It was for them to cry out against the injustice; for so long as the dealers could sell it they would do so in a high minded way; and they gave no guarantee of its quality. Guano was deteriorating year by year, and they must be satisfied if they obtained 16 per cent. of ammonia, even in manure which they procured from the Government contractors; and it was very probable that it would contain only 13 per cent., whilst 17 or 18 per cent. was the proportion of ammonia, is the best yields of Peruvian guano. A deterioration of 1 per cent. indicated a loss of from 12s. to 15s. per ton. It was unfair that they should have to pay the same price for a dark wet material which contained less ammonia than the finely powdered, which was difficult to apply to land.

SIMPLE TESTS FOR GUANO.

They could distinguish best Peruvian from inferior qualities, that had been damaged by sea water, as follows:—Peruvian was always a light colour, and had rather a cheesy taste. This flavour disappeared, however, when it was exposed to rain or sea water. Inferior guano was heavier than best Peruvian, which should not weigh more than 68 or 70 lb. per bushel. Thus every farmer could test whether it was genuine or not. He had samples obtained direct from the dealer which contained a larger portion of insoluble matter, sand, which was not mixed purposely with the manure, but was there for the simple reason that it had been scraped too near the rock. Forty per cent. of sand instead of 2 or 4 per cent. made a great difference, when they paid £14 per ton for their manure. He did not wish to go in the way of the legitimate profits of the manufacturers, but he would advise them to agitate the matter until they paid for the quality obtained, and not for good and bad alike.

ADULTERATION OF NITRATE OF SODA.

Nitrate of soda was a manure often used for spring dressing for wheat, but unfortunately it was often largely adulterated with common salt. Nitrate of soda was about £70 per ton, and common salt about 16s. or £1, so that it paid the dealers very well. No manure had been adulterated so much as bone-dust, and it was extremely difficult to get it at the present time. 4½ or 5 per cent. was the proportion of ammonia contained in 100 lb. of genuine bone-dust.

STEAMED BONES.

For manuring pasture land he preferred steamed bones to boiled bones, on account of the steam removing the fatty matter from them, which matter had an injurious effect, preventing the decomposition of the bone-dust. Fresh bones, when sown upon pasture, took many years to come into active play; but if thrown into a heap, and a little wet applied, heat was generated, producing ammonia, which united with the greasy matter, and would prove much more efficacious than bones immediately applied from the butcher, for the fatty matter, in the shape of soap, did not prevent the rain from finding access to the bone and dissolving it rapidly.

SUPERPHOSPHATES.

With regard to the value of another manure, superphosphate, they must give as much as it was worth; it would be necessary to handle it to udge its value, but there was no necessity to mell at it. Speaking generally, its value was etermined by the amount of soluble phosphate f lime it contained, and this amount varied onsiderably, and it could be manufactured at ll prices. Phospho-guano was another manure, e value of which depended upon the amount of luble and insoluble phosphates, and the amount f ammoniacal salts contained in the manufacure. Nitro-phosphate was another description of superphosphate. The nitro-phospl similar manures contained little nitr were not of the best character. In c he would allude to fraudulent man which, he was sorry to say, had bee sold in England. He had some spec ammoniacal manure, which, upon anal found to contain no ammonia at all.

TESTIMONIALS.

Having alluded to the manner in w fraudulent firms obtain their testim cautioned those present to buy only most respectable firms; and when bought it to try it for four or five yea end of which time they would be able just estimate of its value. In buying he would observe that they should fi tain what they really wanted, a rude one with which they desired to dress t or barley, or to benefit their grass lan should also ascertain the character of t and carefully arrange for their man pound; and after they had done thi were men of observation, practical an mental farmers, they would get a sup best article on the best terms possible spectable firms—men who had a rep lose. And they should not be led awa monials pushed in their faces, and not by results which were put before them.

FARMERS AND FARMERS.

He would also desire them not to deal i on a small scale with their brother fa the manure which they vended was, speaking, inferior. Dry night soil, a cheap manures, were of little use. T have a difficulty in getting a fair amou monia in guano at £14 per ton, and leave them to judge the quantity con that sold at £3. In buying guano, th be supplied with a guarantee; and in bu dust, should use the same caution. I chase of superphosphate, they shoul analysed, as it was manufactured at In buying nitrate of soda, a guarant also be required, and it was sold upon i and, in purchasing, the strength requir be stipulated. He trusted these prec measures would be of use in the pu artificial manures. The subject was tant one, and he would like to have allu Manure Supply Associations which being promoted; that, however, was a which they could consider at their leis

DR VOELCKER ON MANURES AND FEEDING CAKE.

the monthly meeting of the Royal English last week, a report on manures ake was submitted from Professor er, the importance of which justifies iving it a prominent place. It will be om the Professor's analyses that agricul- are very often victimized: In fact, to put ain language, they are constantly being d. Such examples as those furnished ought certainly to prevent farmers from manures or cake without chemical s, for although these are not always a feguard against chicanery, as the differ- that often occur amongst chemists still they are to some extent a protec- The Society has done well in publish- se facts.

PERUVIAN GUANO.

e is at the present time need of very great in the purchase of Peruvian guano. es have been forwarded to Professor er from all parts of England ; for instance, Devonshire, Staffordshire, Nottingham- and Surrey, in each of which the guano, gh in some cases coming direct from the ers, and being genuine Peruvian guano, maged by sea-water, contained a consider- oportion of sand and rock, and was inferior e to the best samples by 50s. to 60s. per The great number of these guanos that een forwarded for analysis prove the truth warning given earlier in the year, that the es of guano now arriving are so variable certain that great caution is necessary in g purchases of this manure. The follow- examples of such inferior guanos :—

oisture	16.10
ganic matter and ammoniacal salts	43.98
osphate of lime	20.73
kaline salts	10.01
nd	9.18
	100.00
*Containing nitrogen	10.65
Equal to ammonia	12.21

uano was sold as " best Peruvian guano," , 2s. 6d. per ton. It is, however, not best ian guano, for it is damaged by sea-water, ns too much sand (rock), and yields only 12 per cent. of ammonia, and is worth about £2 less per ton than Peruvian of average quality.

Moisture	17.79
*Organic matter and ammoniacal salts	46.24
Phosphates	20.21
Alkaline salts	10.75
Sand	5.01
	100.00
*Containing nitrogen	11.49
Equal to ammonia	13.95

This guano was bought at the full market price of £14, 5s., cash. It is genuine, but damaged by water, and worth about 25s. to 30s. less per ton than good Peruvian guano.

Moisture	16.04
*Organic matter and salts of ammonia	41.38
Phosphate of lime	20.81
Alkaline salts	9.32
Insoluble siliceous matter	12.45
	100.00
*Containing nitrogen	9.65
Equal to ammonia	11.71

The bulk of this guano was delivered in a very damp state, and with a quantity of stone. The quality was guaranteed first-class Peruvian guano, and the price charged £14 per ton. It is genuine Peruvian guano damaged by water, and, apart from the larger stones, contains 12½ of fine siliceous matter (rock), and yields only 11¾ per cent. of ammonia, instead of 14½ to 15 per cent., which Peruvian guano of good quality at present contains, on an average.

OTHER GUANOS.

The committee next directed attention to the following analysis, shewing the composition of a sample of British guano, sent to Dr Voelcker by Mr H. Robbins, Northfield Farm, Witney:—

Moisture	26.80
*Organic matter	11.09
Phosphate of lime	.65
Oxide of iron and alumina	2.94
Carbonate and sulphate of lime	47.26
Alkaline salts and magnesia	1.72
Insoluble siliceous matter	9.54
	100.00
*Containing nitrogen	.53
Equal to ammonia	.64

This so-called guano is sold as Pound's British Guano, at High Street, Bromley, Bow, E., at £3, 10s. per ton, and is described by the maker as "an extraordinary scientific combination of night-soil, sulphate of lime, and bones, possessing immense body, which gives it great durability and feeding power, whilst no known manure can compare with it in quantity of fixed ammonia." The preceding analysis, however, shews that the sample sent to Mr Robbins contains merely a fraction of 1 per cent. of ammonia and phosphate of lime, and is all but worthless as an artificial manure. Its strong smell is chiefly due to animal or bone oil.

SUPERPHOSPHATE.

Many samples of superphosphate, which contain either no bone whatever, or but very little, are sold this season professing to be made from bone. The following case is an illustration of this fact:—

Composition of a sample of superphosphate advertised as made from bone, sent by Mr S. Browne, Brockton, near Shifnal, Salop, bought from Mr George Dawler, Plume Works, Aston, Birmingham, at £7 per ton.

Moisture	11.76
Water of combination and *Organic matter	25.33
Biphosphate of lime (monobasic phosphate of lime)	1.69
Equal to bone phosphate (tribasic phosphate of lime), rendered soluble by acid, 2.56	
Insoluble phosphates (coprolite powder)	17.91
Sulphate of lime	28.27
Alkaline salts and magnesia (common salt)	5.18
Insoluble siliceous matter	9.86
	100.00
*Containing nitrogen	.56
Equal to ammonia	.68

Practically, this bone superphosphate contained no bone, but was a badly made coprolite superphospate, containing only 2½ per cent. of soluble phosphate. It would be dear at £3, 3s. a ton.

As [illegible] instance of the caution that is requisite [illegible]ent of agents for the sale of manures, the [illegible]ttee wish to call attention to the following [illegible] which the son of a farmer was about to become agent for a manure known as the British Economical Manure. Before undertaking this agency he was requested by a friend who had formerly purchased the manure to have an analysis made of the article, and accordingly Mr Stephen H. Allen, of Eastover, Andover, forwarded a sample to Dr Voelcker, which was analyzed, with the following result:—

Composition of a sample of British Economical Manure, sent by Mr Stephen H. Allen, Eastover, near Andover, sold at £12 per ton by B. Coveney, 17 Devonshire Square, BishopsgatStreet, E.C.:—

Moisture	9.86
Crystalized sulphate of iron (green vitriol)	28.81
Sulphate of lime	2.05
Chloride of sodium (common salt)	13.39
Bisulphate of soda	30.69
Insoluble siliceous matter (sand)	15.20
	100.00
Nitrogen	.06
Equal to Ammonia	.07

The proprietor of the British Economical Manure states in his prospectus that 1¼ to 1½ cwt. per acre has been found in result equal to 3 cwt. of the best Peruvian guano, and cautions farmers not to apply more than 1¼ to 1½ cwt. to the acre. This caution is very appropriate, for a compound like the Economical Manure, which contains no intrinsically valuable fertilizing matter, and which is a mixture of cheap saline matter with green vitriol—a constituent inimical to vegetation—is certain to do injury if it be used in quantities in which Peruvian guano and other concentrated artificial manures are usually employed.

LINSEED CAKE.

Cake is often sold as genuine linseed-cake, which is either made from inferior and undressed seed, or is mixed with other articles. The following is a good example of one of these cases:—Mr Dudfield, of Catsley, Bewdley, forwarded a sample of cake branded **B** genuine, brought from Mr Firmston, Stourbridge, price £10, 15s. per ton, and manufactured by Walker & Smith, of Hull. The analysis is as follows:—

Moisture	12.30
Oil	9.69
*Albuminous compounds (flesh-forming matters)	32.50
Mucilage, sugar, starch, and digestible fibre	26.16
Woody fibre	12.03
Mineral matter (ash)	7.32
	100.00
*Containing nitrogen	5.20

This cake was found to be made of dirty linseed, and to be mixed with earth-nut cake.

Messrs Walker and Smith settled the matter amicably with Mr Dudfield.

ther sample was forwarded by Mr Hud f Castleacre, bought of Messrs Marsten of Lynn, as genuine linseed-cake, at 5s., of which the analysis is as follows :—

re	13.78
	10.31
ninous compounds (flesh-forming matters)	30.93
ge, sugar, starch, and digestible fibre....	22.44
fibre	15.53
l matter (ash)	7.01
*Containing nitrogen...... 4.95	100.00

This cake was found to be mixed with earth-nut cake, and although it was by no means a bad feeding cake, it should not have been sold as genuine linseed cake.

Other cases of adulteration have occurred, in some of which the Professor has been able to prevent loss to the purchasers ; but the Committe regret to find that many farmers are unwilling to give up the names of the dealers, resting satisfied with the settlement made in their individual cases.

FARM SERVANTS—HIRING AND PAYING.

HE question as to the best way of hiring farm-servants is one that has often discussed, and one apparently sur- led with much difficulty. There can be sitation, however, on the part of all who attended at statute or hiring fairs, in ing that the scenes there transpiring are om being conducive to the self-respect rality of those who present themselves gagement on the streets or in the pub- ouses. And the orgies which often at- upon and succeed such gatherings are t all creditable to our common nature, en most concerned in them will, we e, be ready to admit when calm mo- of reflection come. Men and women out on the streets, to be examined on physical points by intending employers, t as animals are judged in the markets the show-yards. In fact, masters have ly any other means of judging. As a it may be said they know little of the cters of the men and women who are to offer their services, and they must ore decide upon their fitness chiefly ir robustness, good looks, and apparent . Yet it is well understood, and out occasionally to the pecuniary cost any, that the strongest, best-looking, eemingly healthiest, taken as they ap- at the fairs, are neither skilful workers onest endurable servants.

This being found out, it was thought that Register-Offices should be established, where men wishing to leave their situations, and masters wishing workmen, might be mutually accommodated. It was urged, and with great force we think, that these registers would do away with the drunkenness and debauchery which too often characterize such half-yearly concourses—that the wanting agriculturist would have, through the information obtained from the Registrar, the means of knowing the character and capacity of the offering workmen ; and the disengaged servants, the kind of masters under whose jurisdiction they would like to submit themselves for a term.

Well, Register-Offices were established in many districts, and, as a rule, it may be said farmers interested themselves in their success very considerably. Not so in the same degree can it be said of the ploughmen and agricultural labourers generally, who appeared to be afraid that the institution of Register-Offices would spoil their periodical holidays, which many apparently regarded as the only opportunities in the twelve months they had of meeting their friends. But, so far as we know, it was never meant by any of the promoters of these establishments (and we may take some credit to ourselves in having aided in securing their introduction) that the workers should, by the abolition of hiring fairs, lose their holidays. On the contrary, it was thought that they might better enjoy themselves amongst their relatives and acquaintances without the demoralizing influences which usually accompany statutes and fairs. In consequence of this apathy on the part of those they were designed to benefit, and other difficulties, Register-Offices are, we are sorry to find, not in such a flourishing condition as they ought to be.

These remarks have been called forth by a paper recently read on the above subject before the Staindrop Farmers' Club, by Mr Neasham. In the outset he observed—

> The time of changing our servants in this district—that is, at May-day—is attended with some inconvenience, as the turnip season is then at its height, and every hour lost at that season is of great consequence, not only in the labour of the man, but his wife also, who cannot be expected to leave her house and family just when they have removed into a strange neighbourhood, and have various wants to supply. To change the custom of any country is always a matter of much difficulty, for farmers cannot at all times be brought to act together, when it is even for their interest that they should do so; and whether Chambers of Agriculture may not, after more important matters are disposed of, be the means of altering this state of things, and taking up such subjects as this, is, I conceive, well worthy the consideration of their members. There is another class of farm-servants—to the hiring of which I must allude—and that is, of young unmarried men and women who are usually boarded and lodged in the farmer's house, and these, for the most part, are to be found at the ordinary statute hirings a few weeks before the term—a mode of hiring that has been strongly denounced by some people as tending to vice and immorality. I cannot, however, see how it could be otherwise arranged, so long as the changing from one master's service to another is at one and a fixed time in any district; for, if you adopt the plan of a register-office, which many recommend, their names should be put down some considerable time before the term-day, to admit of anything like adequate attention being given to the many applications that would have to be made, or for the masters to make inquiries as to their characters and qualifications. To many farmers, particularly those of a higher standing, this mode of lodging their men in the house cannot but be a source of constant annoyance and inconvenience, inasmuch as their house, under such circumstances, can scarcely be called their own [illegible] is no uncommon practice, in hiring their foremen, to require them to lodge so many young men in their houses, paying them a sum per week, to be agreed upon; but this, of course, can only be carried out where the farms are large, and the dwellings on them sufficiently commodious.

Having said so much about the hiring of servants, Mr Neasham next spoke about the mode of their payment. He said:—

> I would particularly invite your discussion as to the relative merits of our own system, as regards the payment of our hinds in money (weekly or fortnightly, as the case may be), or of that adopted in other districts, of paying mostly in kind, and a part only in money. Our plan is doubtless attended with less trouble, and affords the labourer the opportunity of going, money in hand, to supply his wants in the cheapest market; but I question very much whether it supplies us with as strong and healthy a servant as when he is paid monthly, in kind. This year, certainly, on the score of economy, those districts which adopt the latter mode have had a decided advantage, seeing that all cereal produce, upon which they chiefly subsist, is selling at a low figure in the market. It will be admitted, I think, that farm wages have, within the last 20 or 25 years, advanced here something like 50 per cent.; and, with all this, we have not, it may be said, so contented, willing or industrious a class of men as formerly, nor one among which so much providence and self-denial are practised, for it is no uncommon thing now to find that, with wages averaging from 16s. to 18s. per week (including, I mean, such privileges as potatoes and a house, rent free), the chances are, the servant has to apply to the parish for relief if sickness or other casualty befall him for a while, as there is seldom anything laid by, the whole of his wages having, in many instances, been spent, and that perhaps extravagantly, as soon as received; besides, when the men are earning so much hard cash, the wife cares little whether she goes out or not.

From the discussion which afterwards ensued, the general opinion appeared to be in favour of an alteration in the periods of hiring, and against the payment of servants in kind. The latter plan, however, we agree with Mr Neasham, has been found highly satisfactory in many quarters, and with him we should like to see our agricultural bodies taking up simultaneously, or at least successively, the whole question of the hiring, housing, paying, and educating farm-servants.

Papers by Tim Bunker.

V.—TIM BUNKER ON CATTLE DISEASE.

SS she's got the cattle disease, by
he looks on her," said Uncle Jotham
rass, as he looked into Jake Frink's
April, at one of the sorriest cows ever
Hookertown. She was down and unable
, had lost her calf, and was very much
the mouth.

t kind of disease is that?" asked Jake,
, evidently prepared to hear the worst.

e disease! you fool," exclaimed Ben
'She is *one of the cattle*, and, of course,
g ails her, she's got the cattle disease,"

her think it's the crow ail," suggested
Nelson Tucker, as he joined his neigh-
the cow-yard, to sympathize with Jake
fliction. "At any rate, the crows will
eeting on her case 'fore long, see if they

dful cavin in for'ard of the hips," re-
Seth Twiggs, as he scratched a match
ll, and lit his second pipe. "I shouldn't
f it was that, a disease they've had in
wn this twenty year."

oks to me like the cattle disease they
g up by. The eyes are glassy, the hair
n end, and the breathing is fast," re-
Deacon Smith.

call it the pleuro-pneumonia, I believe,"
r Spooner, who reads agricultural papers
s theology.

it killed many cattle?" asked Jake, with
d countenance.

s taken off a good many hundreds, and
ing," said the pastor.

she's got it," said Jake, "and I shall
in spite of all doctorin. Salt won't
"

crows will, though," said Tucker, who
the crow ail, as the only theory that
p the mysteries of her case.

ss she's got the slink fever," suggested
k, who had stopped his coal cart to see
trouble was. "They have had it a good
ther's farm ever since I can remember.
e their calves, grow thin with a cough,

, jest tell us, neighbour Frink, what that 'ere cow has been fed on, for I don't want to feed mine the same way," said Seth Twiggs.

"Well, she haint been fed high at all. She aint pizzened with oil meal, or any of them feeding-stuffs they bring up from the city. You see, I'm rather short on't for fodder and stable room, and I kept the old cow on butts and swale hay all the fore part of winter, and foddered her at the stack. She'd allers wintered eout well enuf, and I thought she was so tuff she wouldn't mind it. I put her on to oat straw about the middle of the winter, and have kept her in the yard ever since, but nussin don't seem to agree with the ole critter. She allers was kontrary, blame her. Guess she'll die jest eout of spite."

"Rather high feed," suggested Twiggs, looking across that pile of skin and bones at me, as if I was authority in the matter.

"Now," said I, "the difficulty with this cow is starvation and exposure. If I was here sitting upon a *crowner's quest*, I should find under oath that this animal died of hunger and cruelty, administered by Jacob Frink, of Hookertown.

This conversation of my neighbours, last spring, shews the secret of a great deal of the disease among cattle in these parts. I think starvation and exposure kill more cattle every year, than the lung murrain did. This disease is around in almost every neighbourhood, and thousands are slain by it, and other thousands are so damaged that they are of little or no profit to their owners. It is not thought contagious, and yet it is wonderful how it goes through a whole herd, and spreads from farm to farm. Yet nobody is alarmed, because he is familiar with the disease, and knows the remedy is of easy application.

Now, Mr Editor, I want to have my say on this subject, and you mustn't put the stopper on till I have it out. You see, now is the time to prevent this disease. If you neglect cattle till they get down in the yard, like Jake Frink's cow it is too late, or if it isn't too late, it will cost all they are worth to get them up into good flesh again. You see, folks are greatly mistaken about what constitutes the value of an ox or cow. I take it, it isn't the breath of life in the carcase that makes a cow or ox worth having. But this seems to be the popular notion, that a cow is a cow, whether she have 500 lb. of good wholesome flesh between her skin and bones, or the skin and bones have come together pretty much like a collapsed steam boiler. Men calling themselves farmers, and living in a farming community like Hookertown, seem to think that a poor half-starved cow in the spring is in just as good condition to give milk, and make butter and cheese, as one well fed. They think all the hay and meal they can cheat their cattle out of in the winter, is so much clear gain. They keep animals out of doors, at the stack-yard, through all the cold stormy weather, that are expected to bring calves next April. They lie upon the frozen earth, and often upon the snow, with the thermometer at zero or below. They are fed upon straw, and often upon poor hay, without meal or roots. Now I am not particularly savage in my disposition, but I should like to have these improvident stock owners spend just one night at the stack-yard with their poor shivering cattle. I rather guess they would build barns or sheds, and make them comfortable.

A cow kept in this way comes out in the spring in poor flesh, too weak to bear a good calf, or to make good veal, if the calf is doomed for the butcher. Half the summer is spent in recovering the flesh she has lost during winter. A few years of such treatment weakens her vital force so that she is liable to die a hardening, long before she becomes an old cow. Is it any wonder that cattle become diseased under such treatment, that the ribs stick out, and the hair sticks up, and the crows scent their prey? We have got laws that fine men heavily for abusing dumb animals with the whip. We ought to have others that will prevent them from torturing their animals with frost and hunger.

My remedy for cattle disease is, first, good warm cowhouses. They can be made tight, and at the same time be well ventilated. Without them, no amount of feeding can keep the anima comfortable, or make it profitable to the owner.

And secondly, good feed, and plenty of it, good hay well cured, oatmeal, linseed meal, or cotton seed meal, with the roots—carrots, beets, and turnips—are articles that should enter into the bill of fare. As a rule, the more a cow eats, the more profitable she is to her owner. You might as well think of having meal when you don't put corn into the hopper, as milk and butter without plenty of fodder. There is nohing like having a good lot of flesh and fat to start upon in the spring, if you want to make a good dairy, and keep your cattle clear of disease.

Yours to command,

TIMOTHY BUNKER, ESQ.

NO. XLV.—TIM BUNKER ON LIGHTNING-RODS.

MR EDITOR.—"What are you putting up that iron thing on your barn for?" asked Jake Frink, as we were at work upon the last job about the barn, about which I have not yet said anything.

"I am going to have the barn finished," I said "We want a rod just as much as we want windows in the frames, or slates on the roof."

"I guess the litenin 'll go where it is sent, rod or no rod," observed Tucker, as he thrust a new piece of pigtail into his cheek.

"Wasn't Squire Rodman's house struck with lightnin last week, though it had a rod on it?" asked Jones, triumphantly.

"Yes, but the rod was joined with hooks and eyes, and the connexion was not perfect," observed Mr Spooner, who was one of the group.

"Don't you think you're provokin the Almighty by puttin up that rod?" asked Deacon Little, who has never forgiven me for turning salt marsh into meadow, and raising three tons of herds-grass to the acre. "You see," continued the Deacon, in his favourite style of argument, "that what is to be will be, and you can't help it by lightnin rods or any other instrumentality. If it is decreed that your barn is to be struck with lightnin, I guess iron rods ain't goin' to save it. A man better not tamper with thunderbolts."

"Now," said I, "Tucker, what have you got a chimney to your house for?"

"Why, to carry the smoke off, to be sure, and to keep the house from burning up when we make a fire."

"Well," said I, "won't the smoke go where it is sent, just as much as the lightning? And yet you don't find any difficulty in making the smoke follow the inside of the chimney, until it gets up in the air out of your way. Now, I admit that lightning is a little more dangerous to handle than smoke, but it follows certain laws, just as straight as smoke does. You see, lightning has what the philosophers call an affinity for iron, and it follows the outside of a rod, just as smoke does the inside of a chimney. Some say it goes down, and others say it goes up. At any rate, it sticks to the rod, and so passes off without doing any damage, just as smoke sticks to the chimney. If you want to know why it doe that, I will tell you when you can tell why smok goes up the chimney. It follows the rod tha is built for it, just as regularly as a locomotiv follows the railroad."

"An engine would go rather promiscuous Squire, ift wa'nt for them 'ere rails," said Set Twiggs, as he blew an extra puff from his pip g that smoke would go where it was n it did not follow a chimney.

at ain't a fair argument," said Deacon ou know it ain't, Tim Bunker, you Ve make smoke and can control it, lmighty makes the lightning."

Deacon," I asked, "what have you put n your house for?"

to keep out the rain, of course."

well," said I, "and the Almighty makes if He don't make smoke; and if a be wet, he will be, and you can't help ng slates over his head, or by any other tality. It is no use tampering with h's deluge was made of."

acon saw he was caught, and looked Ir Spooner for help. He always be- Ar Spooner's orthodoxy, when he sides elf, otherwise he is heretical.

not see how you can get round the rgument against slates," remarked Mr rather dryly.

ds to reason," I continued, by way of the argument, "that rain is just as eaven-sent article as lightning. If a ise in turning off the rain by a slate, t be a fool, or an infidel, in turning ghtning by an iron rod." It is sur- Ir Editor, to find so much ignorance idice in the community against the ightning-rods. It is just as well the minds of all intelligent people, e conductors are a complete protec- nst lightning, as it is that roofs are a protection against the storm. Roofs s leak, and the rods sometimes do not In either case, the fault is not in the ut in the imperfect realization of it. oof is a complete protection against good rod is a complete safeguard ghtning; and yet we find a hundred re we find one rod. A house or barn is l finished when the roof is on, and the n the windows. I don't consider it ntil the lightning-rod is on.

eople consider it pretty good policy to d against fire, though there are some n to think it a sort of gambling to do man builds a barn, worth £500, and stock and hay and grain are in, it is less than £800. He gets it insured, say of 12s. a-year, and thinks it good economy. Upon the same principle that a man gets insured against fire, I think he had better get insured against lightning. It is much cheaper, and he has the advantage of being his own insurance company. All the rods that protect my barn, with the expense of putting them up, cost only £5, the interest on which is only 5s. a year. The protection is perfect, and the rods will last as long as the barn does.

It is very common to read in the papers of lightning striking barns—setting them on fire, or killing oxen and horses sheltered in them. I consider that there is more danger to buildings in the country from this source than there is from fire. In the city it is different. The lightning-rod is a very cheap insurance company. It never proves bankrupt and fails to pay. Dishonest clerks will not run away with the capital. Scamps and scoundrels can't steal the fluid and fire the barn with it. It will follow the rod with a good deal more certainty than smoke follows the chimney.

The pecuniary advantage of this protection is clear enough, and I guess Deacon Little will begin to see it pretty soon. But this is only one item. You see, it is a great satisfaction to know that your stock and your family, as well as your buildings, are all safe when a thunder shower comes up. I am not more scary than most people, but it is a mighty uncomfortable sensation, when the thunder is crashing around your dwelling, to think that the next bolt may find its way to the earth through your body, or through one of your family. As our bodies are very good conductors, and we are not born with lightning rods on us, I think we had better put them on our houses, and then the lightning will go just where we send it.

I always noticed, before I put up the rod, that Mrs Bunker took to the bed as regular as a thunder gust came up in the summer. She has got considerable courage, but she said "no woman could be expected to stand lightning." But since we have had the rod, she sits by the window reading, with her spectacles on, just as calmly as if the lightning never killed folks. I don't know how 10s. or 12s. a-year could purchase so much comfort in any other article. People's tastes differ, you see, about comfort. Mine runs towards lightning-rods.—Yours to command,

TIMOTHY BUNKER, ESQ.

Our Library Table.

How Crops Feed. By Samuel Johnson, M.A. New York: Orange, Judd, & Co. London, Trübner & Co.

THE sub-title of this book is "a treatise on the atmosphere and the soil as related to the nutrition of agricultural plants." In his preface to the volume the author says—"The writer does not flatter himself that he has produced a popular book. He has not sought to excite the imagination with high-wrought pictures of overflowing fertility as the immediate result of scientific discussions or experiment, nor has he attempted to make a show of revolutionizing his subject by bold or striking speculations. His office has been to digest the cumbrous mass of evidence in which the truths of vegetable nutrition lie buried, out of the reach of the ordinary inquirer, to set them forth *in proper order and in plain dress for their legitimate and sober uses.*" The italics are not the author's, but ours, and the object of the change of letter will be apparent from the extracts we give below. We have looked over the book with great interest, and we must candidly confess that we cannot flatter the author, any more than he could himself, that he has given a popular book to the world. We cordially agree with him further in what he says in his preface, that he has been a collector of facts rather than an originator, and that it must have cost him "severe study and labour to discover the laws and many of the facts which are laid down in the following pages." So far, and no further, our unanimity. Now comes "the winter of our discontent." Look at the following extract, and say whether it is an attempt "to excite the imagination" or not, or whether "the cumbrous mass of evidence," collected from all the great names in agricultural chemical research, which Mr Johnson has come across in his reading, have been well digested or otherwise, and whether or not the results have been set forth "in proper order and in plain dress" for the scientific enlightenment of plain work-a-day *practical* farmers.

ASSIMILATION OF ATMOSPHERIC FOOD.

"Boussingault has suggested the very probable view that the first process of assimilation in the chlorophyl cells of the leaf—where, under the solar influence, carbonic acid is absorbed and decomposed, and a nearly equal volume of oxygen is set free—consists in the simultaneous deoxidation of carbonic acid and of water, whereby the former is reduced to carbonic oxide with loss of half its oxygen, and the latter to hydrogen with loss of all its oxygen, viz.:—

$$\begin{array}{ccccccccc} \textit{Carbonic acid} & + & \textit{Water.} & = & \textit{Carbonic oxide} & + & \textit{Hydrogen.} & + & \textit{Oxygen.} \\ CO_2 & + & H_2O & = & CO & + & H_2 & + & O_2 \end{array}$$

In this re-action the oxygen set free is identical in bulk with the carbonic acid involved, and the residue retained in the plant, COH_2, multiplied by 12, would give 12 molecules of carbonic oxide and 24 atoms of hydrogen, which, chemically united, might constitute either glucose or levulose, $C_{12}H_{24}O_{12}$, from which by elimination of H_2O would result cane sugar and Arabic acid, while separation of $2H_2O$ would give cellulose, and the other members of its group.

"Whether the real chemical process be this or a different and more complicated one, is at present a matter of vague probability. It is, notwithstanding, evident that this reaction expresses one of the principal results of the assimilation of carbon and hydrogen in the foliage of plants."

Again, we have the following about the

OCCURRENCE OF AMMONIA IN THE ATMOSPHERE.

"Graham has shewn by experiment (Ville, "Recherches sur la Vegetation," Paris, 1853, p. 5), that a quantity of ammonia like that found by Fresenius is sufficient to be readily detected by its effect on red litmus paper, which is not altered in the air. This demontrates that the atmosphere where Graham experimented (London) contained less than $^{133}|_{10,000,000}$ths of ammonia in the state of bicarbonate. The experiments of Fresenius and Grager were made with comparatively small volumes of air, and those of the latter, as well as those of Pierre, and some of Bineau's, were made in the vicinity of dwellings, or even in cities, where the results might easily be influenced by local emanations. Bineau's results were obtained by a method scarcely admitting of much accuracy."

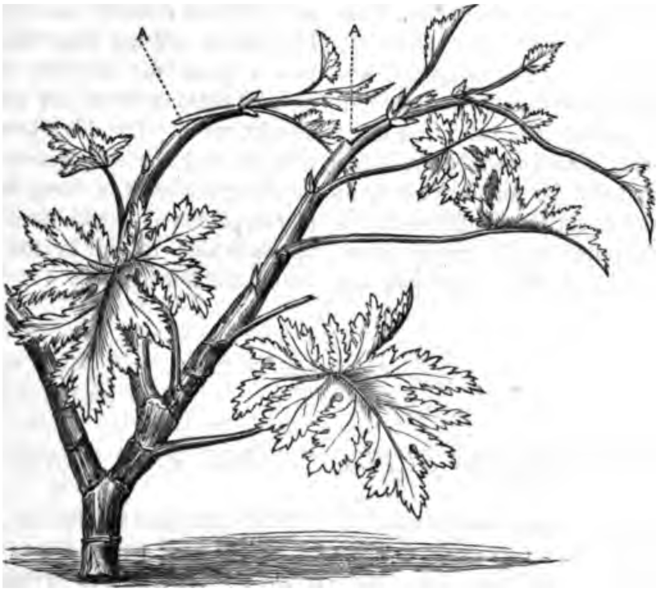
On our word of honour these are fair specimens of the book; and, as *must* be seen, the amount of edification to be gleaned by agriculturists from a perusal of the whole book will be nearly as incalculable as the fraction in the last quotation.

The Garden.

PROPAGATING OF SUCCULENT PLANTS IN SUMMER.

THE following novel mode of propagating succulent plants in the summer is abridged from a paper which appeared in the "American Horticultural Annual":—

Every one who has attempted the propagation of plants by cuttings during he high temperature we have in the month of July and August, is aware of the great difficulty experienced in doing so, no matter what system or process is resorted to. In cases, with those having the means of propagating plants, this difficulty in rooting cuttings during the summer months is not of much importance, as florists usually reserve stock enough to enable them to produce all the cuttings they require at the proper season for propagating—namely, September, October, and November. But with amateurs, who have but a plant or two of some favourite variety, and who wish safely to increase it, this (to us) new practice, is likely to prove of some benefit. The increasing taste for the new kinds of variegated pelargoniums induced us to purchase a number of the tricolor section, of which the well-known sort Mrs Pollock is a type. These we found to grow rather slowly, and to increase them to the best advantage became a matter of consideration. Layering in the these months plants of a succulent nature, such as carnations, geraniums, petunias, &c., &c., grow rapidly, and the shoots formed are in consequence watery and soft, so that, when detached from the plant and used for propagation at that hot season of the year, the chances are that few will root, but will, as gardeners term it, "damp off" in a few days after being put in as cuttings. In ordinary



Method of Layering in the Air.

usual way, by bending them down to the ground, was, of course, in plants of that style of growth, all but impracticable. To have taken off cuttings would have not only further enfeebled already feeble plants, but the prospect of rooting these cuttings in hot weather was nearly hopeless; so a compromise was decided on, which, for want of a better term, we call "layering in the air." As shewn in the figure, the shoot is "tongued" (see A) in the manner of an ordinary layer. This has the effect to arrest the upward flow of the sap at the incision, which, of course, acting to some extent as if the shoot had been taken off, induces a branching out *below* the "layer," providing shoots for further operations. But the effect on the vigour of the plant is much better than if the layer or shoot had been detached; for, by the time it takes to get hardened and form a *callus*, the shoots branching out below the cut are fit to supply the loss of foliage sustained when the layer or cutting is detached. The cutting or "layer" is in condition to be cut off in five or six days from the time it has been tongued, and will be found not only to be healed up, and in such a condition that it will quickly emit roots, but the whole cutting presents a well-ripened, firm condition, not easily described, but readily detected by the practical propagator. When detached, they should be treated in all respects as ordinary cuttings, duly watered, and shaded for a few days until they strike out roots, when they are potted off in small pots in the usual manner. During the unprecedentedly wet summer that we had in 1867, we found that many of the plants of the variegated pelargoniums and variegated rose geranium Lady Plymouth, operated on in this manner, produced roots half an inch in length, as they hung in the air; but this was of no special advantage, as we found that those that merely healed up and *callused* made just as fine plants as those that had formed their roots before being cut off.

Plants thus formed make much finer plants than regular layers, as they are to all intent and purpose cuttings, and consequently, unlike layers, are not long dependent on the parent plant for support, being indebted little or nothing to the old plant during their development. By this system of propagation we had the satisfaction last season of doubling our stock of many rare and valuable plants, which it would have been perfectly impracticable to do in the usual manner during the hot months.

TREES AND SHRUBS SUITABLE FOR THE FARM GARDEN.

COUNTRY gentlemen are often at a loss to know what trees they ought to select out of catalogues, of the innumerable arbora-eous plants now in cultivation. The chief im of some individuals is to procure trees at will grow up quickly, and form immediate helter, without any reference to artistic effect r after appearance. I recently inspected a ewly finished house, with the enclosed ground ntirely surrounded with Poplars and Spruce irs. The proprietor having been advised to plant these kinds as being the best for immeiate shelter, had at once sent his order o a nurseryman for an assortment of Poplars, each 6 feet high, and Spruce Firs 4 feet high. If he had gone personally to a nurseryman, I have no hesitation in saying that he would have been advised differently. Not 200 yard from this residence some very fine shape Sycamore trees were growing, and I advise him, as I had advised many others before, t study the trees that seemed to thrive best o the adjacent properties and plant accordingly This proprietor has since, I believe, substi tuted a Sycamore for every alternate Popla In some villa enclosures, it is absolute necessary to plant some trees to grow fast fo present protection, and these are frequent

ong with others ultimately intended
Owing to the free growing nature
s and Poplars, they are usually
nurse trees; but if allowed to take
ey will severely injure the intended
ones planted along with them. If
necessary to plant an outside belt
ery one ought to be good, such as
Beeches, Birches, Elms, Oaks,
beam, and Norway Maple, each
d not to be under 5 feet in height.
d for them ought to be trenched,
ree planted with a little decayed
ut if planted without trenching,
should be prepared for each, and
good soil, using a little decayed
cover the roots while planting. If
adopted it will be found that the
ated will make rapid progress, and
rmanent shelter in due time; while
d Willows which grow too large and
villa residences have to be cut
gether, or the tops taken off, thus
them unsightly as long as they
they have seriously injured the
ermanent trees planted with them.
arge properties, Poplars and Wil-
be introduced with good effect,
y not in villa enclosures. In the
of cases, trees are only wanted on
. For the guidance of villa proprie-
ng, *particularly in North Britain*,
ention to give the names of some
hrubs noted either for their flowers,
general outline. A very long list
uld be given, but it is not neces-
so here, as a few of the more
and conspicuous will be sufficient
pose, instead of getting bewildered
es enumerating several thousand
l varieties.

IDUOUS FLOWERING TREES.

luous flowering trees, the different
the Hawthorn are highly desirable,
the variety known as the Weeping
ary Thorn, which is peculiarly
villa culture, owing to its pendant
graceful outline. In all cases it
ought to be trained to a single stem by the periodical removal of the lower branches, until it assumes the height required. The Double Scarlet-flowering Thorn, as well as the Single Crimson-flowered variety, are also worthy of cultivation, and, like the Queen Mary Thorn, are wonderfully improved by a free use of the knife. Other flowering trees worthy of notice are the Mespilus Canadensis, Pyrus nivalis—scarlet and yellow flowering, Horse Chesnuts, Quince, Double-flowering Cherries, the Bird Cherry, Flowering Ash, and the different varieties of Laburnum, particularly the variety called Cytisus Adami. This peculiar sort can boast of three different kinds of flowers and foliage on one tree.

WEEPING TREES.

Weeping trees are generally very graceful and appropriate for villa garden culture, and of these may be mentioned the well known Weeping Ash, also the Weeping Elm, Lime, Beech, and Birch, the perfumed Cherry, Weeping Napoleon, American and Kilmarnock Willows, Weeping Mountain Ash, Weeping Aspen, Weeping Walnut, and the pendulous Sophora japonica, one of the most remarkable of all the weeping trees.

VARIEGATED-LEAVED TREES.

Trees with variegated and coloured leaves form a large section, and many of them are admirably adapted for villa garden culture. Of dark-leaved trees may be mentioned the well known purple Beech, also the purple-leaved varieties of Hazel, Oak, and Elm. The Corstorphine Sycamore (generally known as the Corstorphine Plane) is an ornamental tree not generally cultivated, but one deserving a corner in every villa garden. Its golden coloured foliage during early spring, is very attractive, and its graceful outline is also a recommendation. With it may be mentioned the variegated and purple leaved Planes, also the variegated Elm, and variegated Common and Turkey Oak; this latter is perhaps one of the most desirable. The variegated Acer Negundo is also a very ornamental tree, but does not succeed well in all situations.

Although Poplars are not generally recommended as ornamental trees, I cannot overlook the variety known as the Snowy-leaved Poplar (Populus nivalis), its beautiful white leaves contrasting admirably with the foliage of other trees, and by an occasional use of the knife it can be trained into any shape.

UPRIGHT-GROWING TREES.

There are several upright-growing trees worthy of cultivation, and admirably adapted for villa garden purposes, as they occupy comparatively little room, even when full grown. In some situations the Lombardy Poplar can be planted with advantage; besides it we have the Upright-flowering Thorn, having precisely the habit of the Lombardy Poplar, also the upright Elm and Service Tree, upright pyramidal and fastigiate Oaks (Quercus pyramidalis and Q. fastigiata) of which several interesting varieties are now cultivated. The upright Quercus pannonica deserves to be a special favourite, being one of the most beautiful of all the ornamental trees. Its leaves are as large as the Spanish Chestnut, and of excellent outline, which, from its peculiar but stately habit, and being very hardy, is worthy of a place in every lawn.

TREES OF ORDINARY HABIT.

Of trees of ordinary growth and habit, the following can be recommended either for their large, small, or graceful foliage: Tulip trees, large-leaved deciduous Magnolias, Oriental and Occidental Planes, American Oaks and Lime tree, Chestnuts, Sorbus vestita, one of the handsomest of the Service tree tribe, having large oriental leaves; also the large-leaved Alnus cordifolia, not forgetting, if room to spare, the Birch, Lime, American and British Hornbeams, Locust tree, Snake-barked Maple, and American Hickory.

EVERGREEN TREES.

Several evergreen trees of medium growth are particularly adapted for villa garden purposes, such as the Evergreen Oak, Cork tree, Hollies, Strawberry tree (Arbutus Unedo) Portugal Laurel, as well as Yews, Wellingtonias, Deodar, Lawson's Cypress, Araucaria imbricata, Thuja gigantea, Thujopsis dolobrata and boreale, and the African or Mount Atlas Cedar (Cedrus atlantica) which is one of the most interesting, and perhaps the hardiest of all the recently introduced Conifers. It grows freely, and its height and outline should be encouraged by a judicious trimming of the branches round the lower part of the stem with a knife. This tree, as well as the Quercus pannonica, before alluded to, I generally recommend as being best fitted for planting as memorial trees. The proprietor of every villa ought to plant one, if not the above mentioned, any other most convenient for themselves, marking date of planting and size. Such memorial trees ought to be placed at such a distance from the house as not to be interfered with by the future growth of other trees.

VARIEGATED EVERGREEN SHRUBS.

A considerable collection of variegated evergreen shrubby plants are now to be found in the British Nurseries: a few may be mentioned here, such as Aucuba japonica, and the variegated Holly. The varieties of this last named plant are now very numerous, the best of them all is perhaps the Golden Queen, and one which no villa garden ought to be without. We may add to our list the variegated Golden Yew, either grafted on the common Yew, or on its own root, and trained so as to assume the appearance of the Irish Yew; also the silver variegated yew (Taxus elegantissima). Two other shrubby plants are deserving of notice, viz.: the Thuja aurea and Biota elegantissima. The former is a globular growing shrub, brown during winter, green during spring, and of a rich golden colour all summer; while the latter is an upright compact growing shrub, going through the same periodical phases as the Thuja aurea, and highly ornamental.

DECIDUOUS FLOWERING SHRUBS.

This paper will not be complete without reference to some of the best flowering deciduous and evergreen shrubs, which are now ionable with cultivators. Of the ıs, we may mention the Japan (Cydonia japonica) Weigelia rosea, ?runus triloba, Scarlet, White, and owering varieties of the Ribes san- , Spira ariæfolia, Philadelphus Gor- Buddlea globosa, Snowball tree ım opulus) also the hardy Fuchsias, 'oom and Azaleas, particularly some ıe coloured Ghent varieties, requiring at soil.

EVERGREEN DWARF FLOWERING SHRUBS.

Of the dwarfer Evergreen flowering shrubs, may be mentioned the various species of Mahonia, Viburnum Tinus, Garrya elliptica, also Kalmia latifolia, angustifolia and glauca, and the innumerable varieties of Rhododendron, with their various tints of white, purple, and crimson. The two last genera ought to be in every villa garden, and must be planted in black peat soil.—*James M'Nab, Curator of Royal Botanic Gardens, Edinburgh.*

WATER CRESSES FOR GARDENS.

ST people relish with immense satisfaction a few water cresses. There :ater favourite upon the tea table to way at along with your bread and Water cress is known to every one ıuth of the Tweed (not quite so well ɔrth) as a water plant to be found ɔnly by the sides of running streams arshy places. Growing in that way ıtural habit no one ever expects elsewhere. "Water cress must re- will only grow in water." So say a ıy people who buy and eat it. Not ıowever, water cress will grow almost and kindly in the villa garden, in soil, as in its native brook, without water than is required for a good The writer of this has grown an supply of as good and crisp fresh ıtable water cresses as ever graced ıarden, from a patch of ground two ıare, behind an old holly bush for rs with but very little attention.

ɿuantities of seed of water cress is Germany and sold for cultivation on It may be purchased for a mere ı any of the London seedsmen, and the Royal Horticultural Society has distributed seed for many years: still it seems to be a thing not generally known that it will succeed so well in the ordinary garden.

The best situations, of course, are the dampest. Such as behind a wall or hedge, or tree which is shaded in some degree from the sun—not that the sun hurts the water cress—but for the greater dampness of the soil. The more water they get, and the damper the ground is, the more mild will the cresses be. The soil should be tolerably good, a little peaty perhaps, and prepared tolerably fine. As the seed is small it is best to sow broadcast, and to cover but slightly with a little fine soil. It should be sown as early as possible now, but March or April is the best time. By September they will be fit to be cut, and an abundant supply obtained throughout the winter and spring.

Those who are fond of water cresses (and who is not?) should lose no time therefore in sowing a bed. There is no garden where they will not succeed. It is a very nice thing to have a supply of water cresses from one's own garden, and somewhat of a novelty, and it will save many a halfpenny. Try.

SUMMER PINCHING OR STOPPING THE GROWING SHOOTS OF FRUIT TREES.

NOW is the time when some attention must be given to this extremely important operation in the cultivation of all small and formally trained fruit trees in the villa garden. Summer pinching is simply a summer pruning of the shoots, instead of doing pruning in winter, as is a common enough practice. It is a far more simple and more easily performed operation, and further, it is greatly more conducive to the production of fruit than winter pruning. To prune in winter we require a knife, but to prune in summer, the thumb and finger only.

The tendency of winter pruning also is towards increased luxuriance, and the production of more shoots. That of summer stopping, judiciously done, towards the production of fruit. By stopping the growing shoots in summer, we arrest the flow of the sap in that particular direction, which must then of course flow elsewhere. Understanding this, therefore, we are enabled, by stopping the stronger portions first, to give encouragement to the weaker; and so regulate and modulate the forces of the tree to uniform action throughout. The natural tendency of trees is to grow upwards, and for the top shoots to grow the strongest. They must therefore be kept in subjection, to allow fair play to the lower and weaker. This is done by pinching, inducing uniform action, and consequently an equal degree of fertility on every part.

The pinching of the young shoots should be begun early, and performed gradually. If the trees have attained the desired size, the shoots of the apples and pears on the pyramid and bush trees may be stopped at about three inches, and of cherries and plums fully closer. At the first pinching, only the upper and stronger growing shoots should be stopped, and then a few days later the next stronger portion, and a week after the remainder. It is extremely bad practice to allow a great mass of shoots to grow up, and then to denude the tree of them all at once. It completely paralyzes its action, and is exceedingly injurious. The second growths on the shoots which have been pinched should be persistently stopped, close to the place where first pinched, as soon as they make their appearance. These second growths being produced from the two or three topmost buds of the shoots, the lower do not star; but being fully exposed to the influence of the sun and air, in general become a mass of fruit buds.

With pyramid trees the shoots on the lower portion should be allowed to grow a little longer than on the upper, and the same remark applies to cordons. The shoots nearest the base should be a little longer than those at the extremities. This tends to give equality of growth.

Very little skill, only a little time and some perseverance, is required in the summer pruning of fruit trees. All that is requisite to remember are the following, what may be called golden rules for villa gardeners—to stop the strongest shoots first, to begin early, and perform it gradually; and by so doing, there are very few trees indeed which will not assume a fruitful condition. It is the best and surest means of inducing fruitfulness in all formally trained trees, which must be pruned in some manner. The greater attention, therefore, which is bestowed on its performance, the greater will be the result, looking on the trees as fruit producing mediums.—*X.*

THE BUDDING OF ROSES.

From "THE VILLA GARDENER."

oses included in the following are the highest quality. They can purchased for something like from d. each.

RPETUALS.

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Valtham
e Sansal
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arie Cirodde

Madame Victor Verdier
Madame Rivers
Madlle. Therese Levet.
Marie Baumann
Marie Rady
Maurice Bernardin
Marechal Vaillant
Monsieur Boncenne
Mrs Charles Wood
Marguerite de St Amand
Paul Verdier
Pierre Notting
Prince de Porcia
Prince Humbert
Prince Camille de Rohan
Princess Mary of Cambridge
Senateur Vaisse
Victor Verdier
Xavier Olibo

NOISETTE

Celine Forestier
Marechal Niel
Triomphe de Rennes

TEA

Gloire de Dijon

these may be safely budded on e for standards, or what is called ti stock for dwarfs. The former , that is *budded* at various heights four feet from the ground. The to the earth so that, in fact, the ve the option of rooting into the

deal of confusion is apt to arise villa grounds by the use of the term ocks. A good many have thought briers were meant. But though ke, and live on sweet briers, they live long nor grow freely. It is worst of all stocks, the dog rose (Rosa canina) is, on the contrary, the very best. And of these, those with brownish looking stems are to be preferred. They should be collected and planted in good ground, deeply dug and well manured, early in November. The most convenient mode for saving ground, and commanding success, is to plant in lines ten inches apart, and six to eight inches between the plants. Between each double row of roses leave a yard of ground clear. This affords the means of free and easy access to the roses on each side. No suckers must be allowed to come up from the roots, no buds to grow upon the ground, and all shoots that come from the stock should be removed during April and May, except two, three, or, at the most, four of the highest. About the middle of June these will often have grown from one to two, or even three feet. The young wood begins to get consolidated, the bark gains thickness and consistency. The practised eye would say at once it is time to bud. The unpractised must prove this by a simple experiment. Cut a slit in the bark with a sharp knife, and try to raise its edge from the wood. If it rises freely, the time for budding roses—the time set by the roses themselves—has come, at least so far as the stocks are concerned.

But two things are needed to bud roses successfully. The stocks must be in the right state and so must the bud. Unless the bark of the rose will separate freely from its woody foundation, budding cannot be successfully performed. The answer, then, to the question is, in general terms, at any time when the bark of the stock, and of the scion or bud, will rise, that is, separate freely from their respective wood. For it is essential that the bark of the stem should open freely to receive the bud, and that the bud with its accompanying bark, should be deposited in its new home with the least possible bruise or injury. Some may take exception to this general principle, as far as the bud is concerned. As long as the stock is right in regard to the free separation of its bark from its wood, it is in condition for budding. If the bud and its bark will not leave the wood freely, some simply cut it off with a thin slice of wood, and insert it without the conditions I recommend. Now, there is no doubt that such buds will often grow; but the plan is not to be commended, especially as the bud and bark budding is so much more simple, expeditious, and successful. Again the question—*when* to bud—may be answered pretty correctly by specifying the time from the middle of June to the middle of August inclusive, as the best budding season, though the operation may be performed at any time when stocks and buds are in the state already described.

And now comes the last question—*how* to bud.

The practice of budding consists in removing a bud and a portion of its bark from one plant, and placing it into another plant, or into another portion of the same plant, in such a manner as that the bud shall grow. The object is that the bud so inserted should form the head or top of the future tree, instead of the stock. We bud choice roses on the dog-rose, that we may enjoy their beauty and fragrance instead of the less interesting stock. In any choice rose we gain, there is one dog-rose the less in the world. The simplest and the commonest way of budding is what is called T budding. The bark of shoot to be budded is cut across with a sharp knife, about 2 or 3 inches above its junction with the main sten of the stock. The bark [illegible] slit down [illegible] middle with the knife in [illegible] base of the shoot. [illegible]erously raised [illegible] budding- [illegible]ception of he [illegible] 5, will, hope [illegible] Fig. 1 is a portion of [illegible] of the ro[illegible] prepared for the bud. B shows the cross-cut through the bark and the longitudinal slit. Fig. 2 is a side view of the bud, with its bark and leaf stalk attached—A, being the bark; B, the bud; and C, part of the leaf stalk. It is very important in removing the wood from the bark and the base of the bud to begin at D and not at A. In removing the rose bud from its place on the shoot, the knife is generally inserted an inch or so below the bud, and a slice of wood is cut off about a quarter or a third the depth of the thickness of the shoot to about ½ inch beyond the bud. This piece of rose wood, with its bark and bud, are then held in the left hand, between the forefinger and thumb, the cut surface being turned upwards. The bud must be held tightly, but without bruising, for now the most important surgical operation connected with budding is about to be performed. The wood is to be separated from the bark so carefully as not to rupture or destroy the roots of the bud. Touch the wedge-like side of the bark at D, and bend it slightly down so as to separate the wood from the bark at the thin edge; then take hold of the wood so separated between the point of the knife and the thumb of the left hand, and pull it steadily off the entire bud and bark up to A. This operation should always be performed from the bottom upwards, as it is less likely to destroy the embryo bud than if it were removed in the opposite direction from A to D. However successfully performed, the base of the bud will occasionall

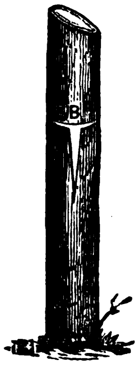


Fig. 1.

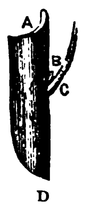


Fig. 2.

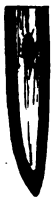


Fig. 3.

l. This will be seen at a glance, if st hole appears at the bottom of as is shewn in fig. 3, the base of eing torn out at the eye-like centre. o destroyed must be rejected. It mpossible that they can grow. The e bud is the centre of growth, and ful to its life and development as is to the stems and leaves. The e will live and even adhere and be- of the bark of the stock, even after of the bud. But while the bud oot perisheth, and its life or death ends upon the presence or absence re of cambium in embryo that is for the use of the buds at their expect growth when that is gone ssibility. You may attempt to call rom a baseless bud, as a great cele- pirits from the vasty deep, and so t will they come? Assuredly not. e bottom of the bud is at least on th other portions of the bark. It still if it slightly projects at that ut if it be depressed it is useless, be put aside and another selected. important element in the success of There must be no delay. Every wind and dry weather reduces the f success. As soon as the wood is and while its own sap is oozing from all directions, place it in immediate ith the flowing sap of the stock. as had time to miss its own nou- id, supply it with that of its foster The bud then has hardly time to change. Next to promptitude I e neatness and closeness of union. light and nimble fingers to bud e knowing head will not suffice e expert fingers. Handiness is the g. This comes with practice and . While the novice is thinking the expert will have his bud out l tied. Some do not even lift the e stock with the knife at all. Hav- e the slit and prepared the l with the aid of a thumb knife point, they make the its own path under the bark, raising it up with apparently as much ease as the snow plough laying up its white wreaths on each side as it moves along. Others, again, make no cross cut. They simply form a longitudinal slit, raise the bark and insert the bud. Still, upon the whole, there is perhaps no surer or simpler method than the one I have described. Take hold of the bud by the leaf stalk, slightly raise the bark and run it down either with the finger and thumb, or, better still, with the side of the knife. I don't, however, approve of doing this by pushing at the base of the leaf stalk. This often destroys the bud. As soon as the bud is inserted in the stock it is a good plan to cut its upper portion off, as shewn at fig. 4. When this portion of the bark of the bud, fig. 2, reaches down to the cross cut on the stock fig. 1, insertion of the bud is completed. It will mostly lie flat to the wood of the stock; but should it not do so it must be pressed smooth and level, and securely tied in its place, fig. 5.

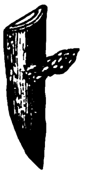


Fig. 4.

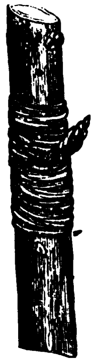


Fig. 5.

Fig. 5 will help to shew how this is done. Fig. 1 shews the position B of the cross cut of the bud, and the base of the slit in the bark. In tying begin below D, and wind round and round till you come to the bud. Here a little scheming is needful, so that no tie touches the bud, while the bark is, nevertheless, made firm around it. The bud passed, the tie is wound round as before and carried a few times beyond B. It is then fastened either by slipping the end under the tie and drawing it tight, or by a dexterous mode of hanging up the other end of the tie on the under side of the stock, and thus binding both ends together to make a common knot when wanted. The tie must not be made so tight as to wound the bark. Common soft matting or worsted are the best materials. In tying, the edges of the bark must be brought as closely together as possible. Some recommend shading the newly inserted buds. It is seldom needed if the operation is properly performed. Dull showery weather should, however, be chosen if possible for the operation, and if it must be performed during bright, hot, dry weather, early morning, a dewy one, is the best time for budding. Only a few buds should be cut at a time, and no bud should ever be got ready for insertion until the stock is prepared to receive it.

The buds will shew they have taken in a fortnight or three weeks. The ties must then be examined and loosened, to give the bark of the bud room to swell. Many err egregiously in wholly untieing and likewise cutting off the shoots from the stocks too soon.

Having now answered the questions of what to bud, I purpose leaving the future treatment of the budded roses, other modes of budding, the treatment of dormant buds, &c., till next month. I hope that this paper may teach some to bud who have never done it before, and others to do it with more ease who may have budded under difficulties, while the accomplished bud grower and expert manipulator among roses, can pass on to the next subject.

It should be borne in mind that while THE VILLA GARDENER caters for the wants and meets the wishes of all, its chief aim is to make the art of gardening easy to those who know nothing of it. And among those many and varied arts that make up the sum total of the science and practice of horticulture, there is none that yields so much pure satisfying pleasure as that of propagating, growing lovely roses.—*D. T. Fish, F.R.H.S.*

THE CULTURE OF TOMATOES.

JAMES CARTER & Co. recommend the following tomatoes which, by their courtesy, we are enabled to engrave for the benefit of our readers. As a rule, tomatoes are not cultivated so much in this country as in America. There, both for ornament and use, they form no inconsiderable portion of gardening produce. For pot culture some of the small sorts are really beautiful, and then the epicure demands, and deals with them as the material for his favourite sauces.

Fig. 1 is what is called the Scarlet Pear-shaped Tomato. As here represented it is [illegible] unlike one of the sorts that was grown at Chiswick in 1867, among a collection sent by Messrs Thorburn & Co., of New York. The variety we refer to was described as having fruit from 1½ to 2 inches in length, of a red colour, and pear-shaped.

Fig. 2 represents the Red Currant Tomato, which is considered by those who have grown it, to be by far the most ornamental of existing kinds for culture. The appearance is much enhanced by the drooping character of the racemes of fruit, and has evidently been both grown in America, and

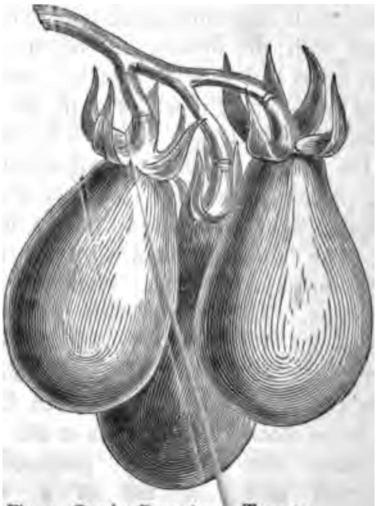


Fig. 1—Scarlet Pear-shaped Tomato.

Continent. The Messrs Carter re- from the Director of the Bordeaux Garden. It may turn out to be a

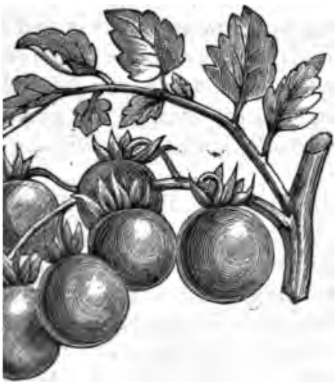


Fig. 2—Red Currant Tomato.

of the Red Cherry grown and proved llection at Chiswick.

3 represents the Yellow Cherry which appears to be a form of the

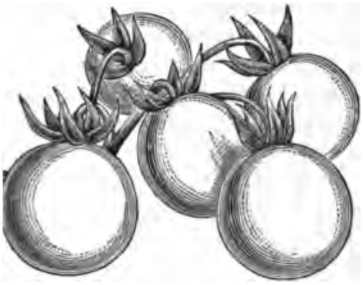


Fig. 3—Yellow Cherry Tomato.

ecies only differing in colour. As ted it seems the freer and larger grow- e two.

ch of our villa constituents as have ultivate a collection of plants, they such, as above recommended, to be rnamental as many of the Solanums, p to buy. Seeds sown in pots will minate in the hot end of the house, h a little care afterwards, such as nded in "Work of the Month," in ases, will be ready for potting off on account and grow as rapidly as a g cockscomb.

is more a decided novelty to us er of the foregoing. It is named Grant, and of course emanates from that distinguished officer's native country. We are told that it originated in the garden of an amateur, fond of these things; and after he had grown it alongside of many other sorts he found it greatly superior. It is far more adapted for the table than those we have noticed above, and on that account will have the chance of being largely sought after by connoisseurs in this country, as well as on the Continent. It has taken highest honours at Massachusetts, and therefore is not unlikely to turn out true to certificate. It is described as in size above the medium, three to four inches in diameter, growing in clusters; form round, slightly flattened, very regular, symmetrical, and rarely ribbed and wrinkled; colour brilliant glossy crimson; flesh unusually firm, solid, and free from water, weighing from ten to twenty pounds more per bushel than other varieties. Skin remarkably fine, smooth, and shining, colouring well up to the stem, a quality very desirable to those preparing them for the table; very productive, and of the finest flavour; bears carriage well, and keeps in good condition a long time after being gathered, retaining its goodness, and free from shrinking.

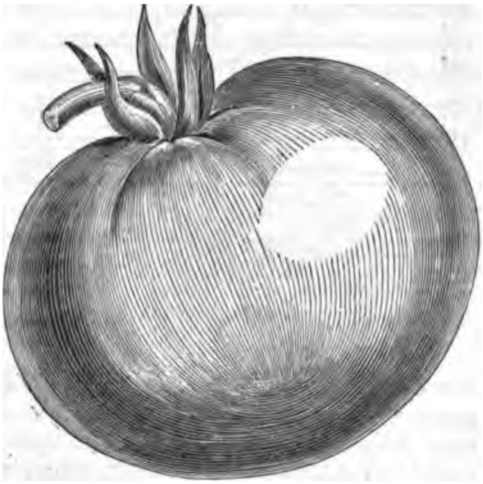


Fig.—84 General Grant Tomato.

Tomatoes may be grown out-of-doors against a wall with southern exposure. In certain places the climate is not good enough for thoroughly swelling and maturing the fruit, and hence the tomato pits we sometimes see. In any case, the plants must be well forward before planting out. The slightest breath of frost affects them, and even cold paralyzes their growth. A short life and merry one is the suitable motto for succesful produce. The great heat of summer is what they delight in, and hence the successful cultivation of them out-of-doors in America. In the best climate of our island, they grow and ripen fruit admirably. For such localities the trellis engraved is very suitable. I used largely in America, and does away, will be observed, with the nail and sh system when wall planting is resorted to. weaving the growing shoots in and out u the thin laths of wood, the plant is effectu secured. It is better to run the trellis no and south as the vines of the plant warp easier than by having them running east west.

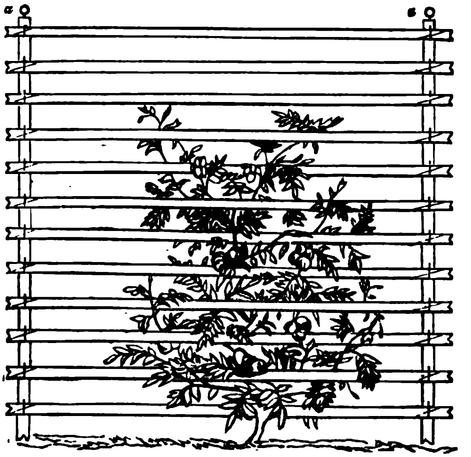


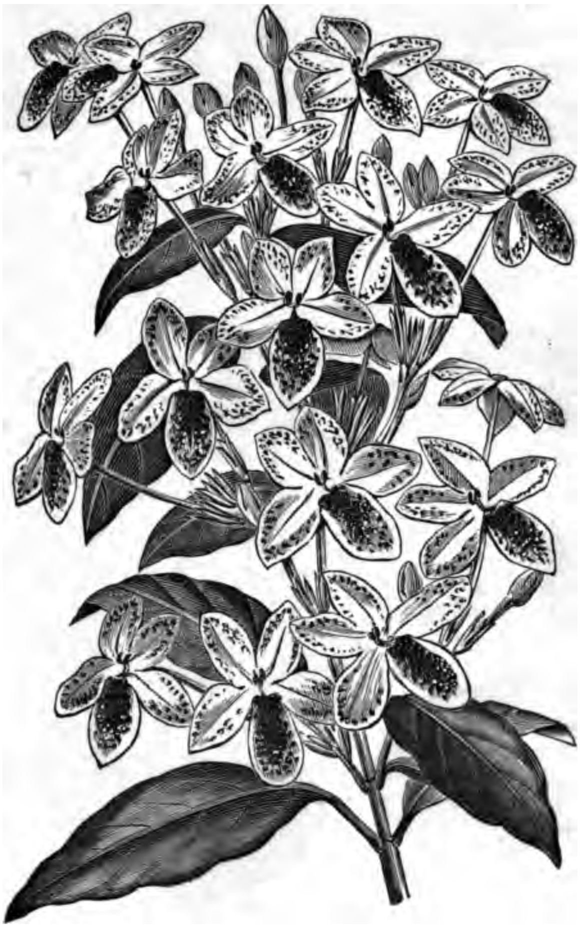
Fig. 5.—Trellis for Growing Tomatoes.

Such a trellis could be utilized in m ways, for flowering climbers, for fruit tr and for boundary screens. For tomato gr ing the upright supports are set in at f feet distance which is plenty of room for best individual plants. The thin horizo laths are set into, on either side, a wor wire support. By this means the trell become portable, and can be removed f place to place with ease and economy. W desired, they can be lifted and stowed a during winter, and be brought out again du the tomato season. Mr Maxwell, of Lc ville, Kentucky, had numbers of plants e feet high last season, completely covering trellis and loaded, according to his own count, with delicious fruit nearly to the tc

NEW AND RARE PLANTS.

ERANTHEMUM ASPERUM.

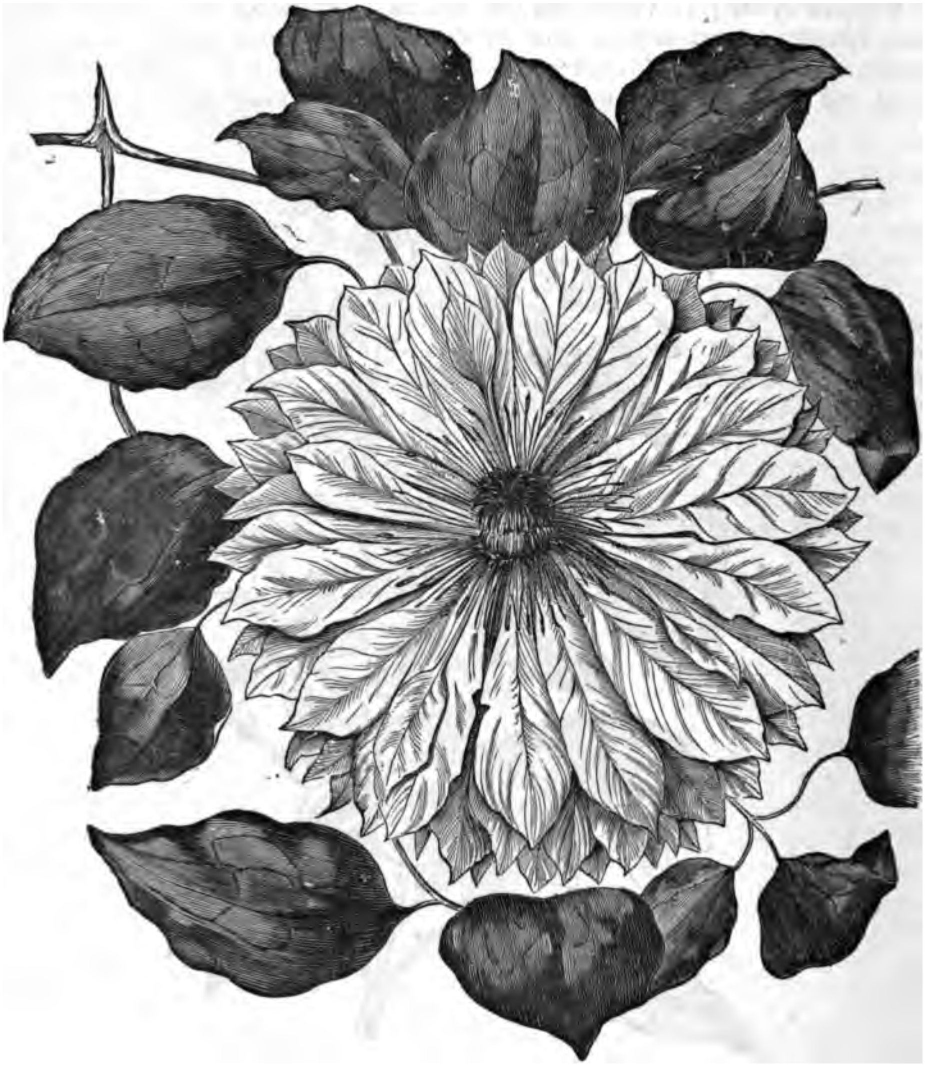
IS spring-flowering acanthad was in- roduced by Mr J. G. Veitch from the n Islands, and proves to be quite an tion in its way. It is of very free grow- it, and the flowers come mainly from erminal portion of the growing shoots. do not generally make their appearance taneously, but come in succession, the idual flowers being rather short lived, dropping out of their rather diminutive calyces. The ground colour is light, which sets off to advantage the numerous purple dots with which each segment is adorned; the lower segment is profusely spotted and blotched. The whole plant is elegant, and will prove a welcome addition to such of our readers as are fortunate enough to be the possessors of a plant stove. We are indebted to the Messrs Veitch for our illustrations.



Eranthemum asperum.

CLEMATIS—JOHN GOULD VEITCH.

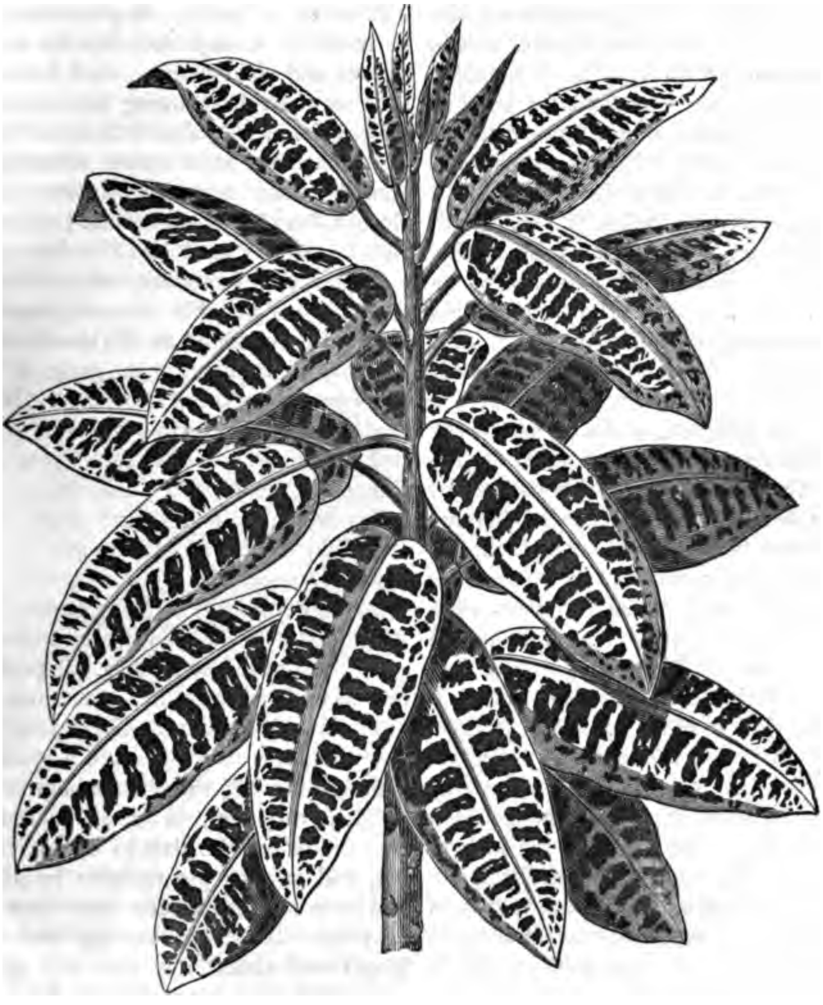
All these Virgin Bower plants are singularly effective. There is scarcely a position in which some of the sorts could not with effect be introduced, from the commoner Clematis viticella, which is one of the most admirable of out-door climbers, to the subject of our present illustration. The plant now under notice, we saw in good style in one of the little Veitchian greenhouses. In size we should imagine it was twice that represented in the engraving, and then the colour, of the most captivating light blue, not unlike the hue of that beautiful orchid that Dr Hooker saw growing so grandly in his Himmalayan tour, Vanda cœrulea. The flowers, besides being large, are very full of florets, which make them what is called more double than any other sort we know. It appears to be quite a distinct species, being imported from Japan, and has taken the highest honours, as a new plant, at some of the International Exhibitions on the Continent, and at the Royal Horticultural Society at home.



'l he New Clematis—John Gould Veitch.

CODIÆUM (CROTON) MAXIMUM.

t will be some little time before we can get ple to change the old familiar name of ton for Dr Master's name of Codiæum; and the one hand, and popular notions on the r hand, we give both, upon the plea that efore to recognize scientific nomenclature h are best. This magnificent introduction nly one of the most beautiful of many very utiful species of Croton that have been roduced by the enterprizing and indomita- perseverance of Mr John Gould Veitch. It was found by him in his trip to the South Sea Islands. Effective as the engraving is, it scarcely gives more than an idea of the richness of contrast between the bright golden ground colour, and the dark green mid and inferior ribs. It is far more effective in point of colour than C. variegatum, and the leaves are large and of a more perfect outline. In the Veitchian stoves it was an object of decided character, and few villa gardeners having stoves for plant accommodation will care long to be without it.



Codiæum (Croton) maximum.

RENDLE'S PLANT PROTECTOR.

IN your last number Mr Robinson gives a favourable estimate of the cultural power and horticultural capabilities of the Cloche. In doing so, he, by comparison, disparages those new and most valuable aids to culture patented by Mr Rendle. My opinion is that there is room enough for both in villa and all other gardens, and that the more of such useful helps we can have in ameliorating the harshness of our climate, on a small but efficient scale, the better. Still though comparisons are justly held to be odious, they are often indispensable means of instruction. We best understand what a thing is by describing what it is or is not like. Things familiar and known become the steps by which we rise into the unknown. Hence the handlight, bell-glass, or cloche, necessarily become standards by which to measure the worth of all our small or portable cultivators. All these have been and are useful, but the whole of them have the drawback of employing a maximum quantity of glass to cover a minimum amount of space. Besides, while they freely admit light in, they readily let the heat out. Rendle's Protectors are formed on a different principle. They employ a minimum quantity of glass to cover the largest possible area. Glass is only employed for the upper or sky lines, and that glass can always be turned to the warmest point of the compass. The plants are lighted only from the sunlight side. Thus, while a cloche, or handlight, presents a transparent side (and that means an [illegible] escape of heat towards the [illegible] other cold quarter), it [illegible] towards the sun. [illegible] the sun-light side passes out, or is radiated through all the cold sides. The same loss of heat is incident to transparent hand-lights and ground vineries, glazed on each side. The Protectors, on the contrary, retain a greater proportion of the heat absorbed. The sun's rays pass in through the glass top and warm the earth and the brick or tile sides of the Protectors. The heat is stored up in the hollow tiles or bricks. It cannot pass away by radiation through such opaque mediums as tiles and solid bricks. And it was in regard to these heat-storing properties that I asserted in the *Gardener's Chronicle* that the Protectors have some special advantages beyond all other temporary shelters, such as cloches, &c. To that statement I still adhere; and I submit that it was a modest and fair estimate of the superiority of the Protectors over all other portable cheap appliances that have yet been offered as aids to culture.

Look, for instance, at the range of usefulness covered by these Protectors. No one denies that cloches grow delicious lettuces, strike cuttings, nourish and grow young plants, and raise seeds. But this catalogue seems well-nigh to exhaust their doings. But there is hardly a fruit-tree, a plant, flower, or vegetable, grown in gardens, large or small, but may be actually grown in these Protectors. Useful beyond measure in all gardens, however large, they will prove endless sources of pleasure, amusement, and profit in villa gardens. Every one with a crown to spare may now have a glass-house complete in itself, without the help of either builder, carpenter, or glazier. The tiles arrive in crates, the glass in a box ready for use, and may be put together by any one, and be in use ten minutes after their arrival at your villa. They can be had of any length and almost any size, and they can grow all garden crops, from the grape, the king of the dessert, to sweet, clean, crisp mustard and cress for your bread and butter. The elements, if we may so express it, of all are alike. Brick, tile, or earthenware sides, and a glass top—these are the constituents of the whole. The lower portion of the front and back walls may be built of comicks on edge, or hollow patent tiles, immaterial which is employed. But er portion of each wall is finished off . tile, grooved to double the depth ary for the insertion of the glass used. ason of this is to allow one square of o be slipped over the other at any of the roof, so as to afford access to the r at any point. The roof is formed of e square of glass fitting in the groove nt and back, and the sides abutting t each other. To give a sharp pitch of . to 6 inches in 30, use one tile or brick the front than in the back walls. It is shing how nearly water-tight such roofs Holes are pierced all along the face of nt grooves for the instantaneous escape water. But a representation of the l vinery, as employed by Mr Rivers of idgeworth, will make all these struc- letails obvious at a glance. No plaster bricks, no putty for the glass is used; erected on the dry-dyke principle, so nown in most parts of Scotland.

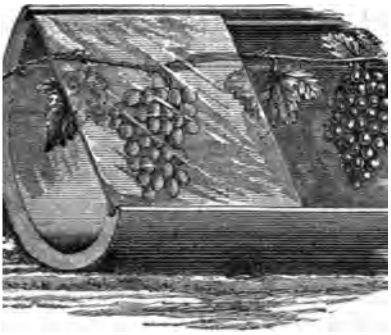


Fig. 1.—Original form of Ground Vinery.

hing could have done better than the in these vine growers last summer. The am Black, especially, was literally laden uit. The original ground vineries were omewhat different form. Something a quadrant and a semicircle (fig. 1) urnished with grooves at top and bot- r the reception of the glass, leaving for the vine, peach, nectarine, plum, pricot, cherry, apple, or other cordon between the tile and the glass front. as an elegant, cleanly arrangement; but it took more material and was more troublesome and expensive to make than the ground vinery now offered by Mr Rendle. Fig. 2 represents the improved style. In these the ground itself forms the base of the structure. In the original form base and sides alike were all formed of hollow tiles, and they had some advantage on the score of greater warmth and perfect cleanliness.

The same form was originally designed for strawberry culture. For this purpose holes were made in the base of the tiles for the admission of the plants. Thus, the strawberries were preserved quite clean, kept safe from birds, and accelerated a full month or six weeks by one and the same means (fig. 1). Whilst the form in actual use (fig. 2) is, however, cheaper and almost equally efficient, the fruit will be preserved perfectly clean, if mulched with clean straw under the leaves, and whole rows may be covered with greater ease and far less money.

For no purpose can these Protectors be of more use than in the growth of strawberries. By covering part of this crop at two or three separate seasons, from the middle of March till the end of May, a marvellously long succession of ripe fruit may be enjoyed. Again, in the neighbourhood of large towns, how often is this most delicious of all kind of fruit ruined with dust and soot! Under these Protectors they are safe from both, and may be had as clean and sweet within a mile of Charing-cross as on a hillside in Aberdeenshire. Raspberries may be perfected under the same Protectors. Bend down, say, three rods, twisted together within a foot of the ground, and cover them with the strawberry plant grower; and ropes of raspberries may be had sweet and pure, and almost as closely compacted together as ropes of onions.

A very good means of procuring thorough ventilation can be effected by simply removing a brick at back and front, and the thing is done. I have generally found, however, that by leaving both ends open, a sufficient change of air was effected. The glass can also be instantly slipped, one square over another, or part of it removed.

Fig. 3 is on an entirely different principle, and is most useful for forcing seakale, asparagus, rhubarb; growing cauliflowers, potatoes, patches of strawberries; the raising of seeds and the protection of half-hardy plants or young and delicate trees and shrubs in pleasure grounds. It consist of a thick earthenware base of about the circumference of a No. 1 flower-pot. A groove runs part of the way round the front edge. A large square of glass is made to fit this groove, the other end projecting over the side of the pot. It is formed to slope towards the south, and the heat absorbed and retained by such a Protector is immense. Three round holes are left under the glass for ventilation, which can readily be stopped with corks or wooden pins in cold weather; and during very hot weather a small piece of wood, to prevent the glass fitting close into the groove, will give a sufficient current of air. In these Protectors, as well as the ground vineries and plant protectors, cucumbers, melons, vegetable marrows, tomatoes, capsicums, &c., can be grown during summer. For the forcing of rhubarb and blanching of sea-kale, slate tops might be substituted for the glass. Again, what admirable things these round Protectors would be to place over early spring flowers or bulbs during severe weather, and to thus anticipate the spring! What bouquets of violets, primroses, hepaticas, squills, narcisusses, hyacinths, tulips; and to—run back right into winter—snowdrops, and even Christmas roses might burst out from under their cosy shelter! But here is a plant protector specially offered for this purpose. Figs. 4 and 5 illustrate the lettuce growers covered and uncovered. It is seldom necessary to cover them, the heat storing capacities of these Protectors being very great. But when intense cold renders covering essential, fig. 4 shews how easily it can be done. Cloches and handlights have this fault, they are difficult to cover. Did you ever try it in the teeth of a March wind? If not you can fancy what it is to cover domes and narrow pointed roofs under such circumstances. But these lettuce growers lie close to the ground and seem almost to invite the straw litter to lie over them. You tell me the cloches and handlights are built round with dung; then what is the use of their transparent sides? Better use opaques, as bricks and tiles, and escape the loss of heat and the risk of breakage together.

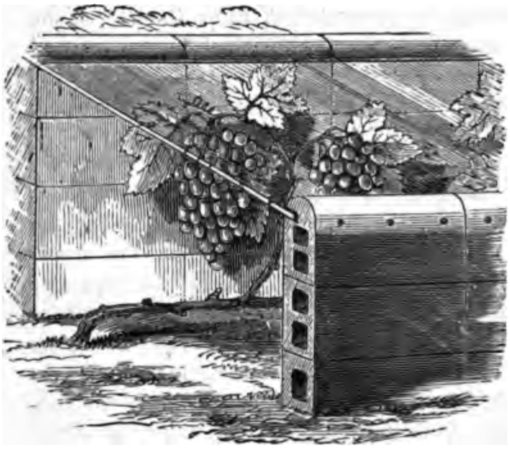


Fig. 2.—Improved form of Ground Vinery.

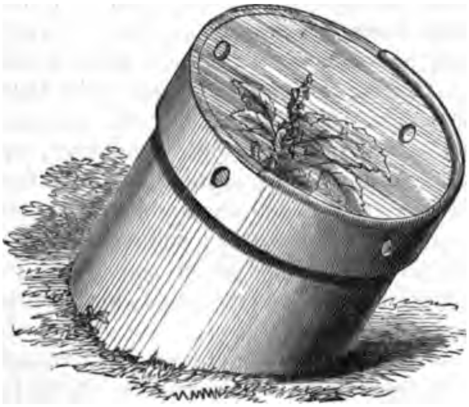


Fig. 3.—Cauliflower Protector.

There are also the pea and French bean Protectors, and there are smaller ones for the raising of seed, &c. In fact, the principle is so flexible that they may be had of any size, from an inch above the earth up to 3 or 4 feet, if desired. But the most useful heights are from 4 to 12 inches in front, and from 6 to 24 inches at back, and from 9 to 24 inches in width. Special varieties are offered for any special purposes, and the prices range from 3d. to 2s. 6d. per running foot. I am not acquainted with any means of protecting or growing so many plants under glass at so small a cost. But for all such particulars, your readers must consult your advertisement columns. Of this I can assure them, that it will prove a boon of the highest order to the possessors of villa gardens. They will do all I have said of them, and much more. I had almost neglected to say, what will be obvious to those who understand them, that they are most flexible in regard to size. Supposing, for instance, a crop of early potatoes, peas, or beans, beat their crowns against the glass, run another row of bricks or tiles along the sides, back and front, and head-room is instantly provided.

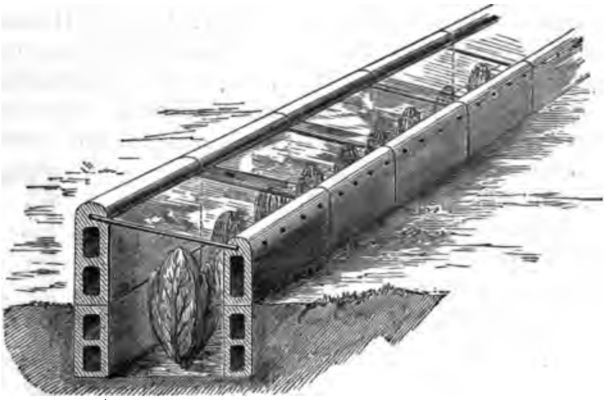


Fig. 4.—Lettuce Protector.

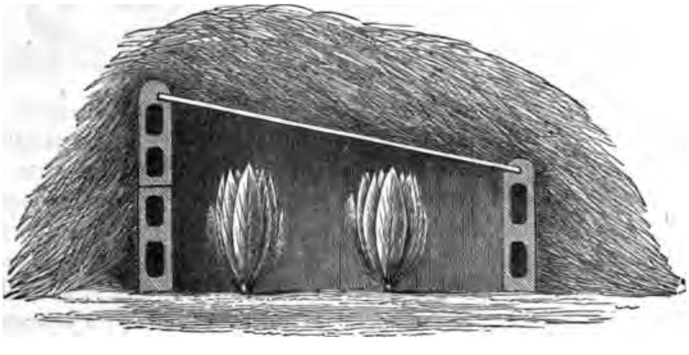


Fig. 5.—Lettuce Protector, covered with Straw, to keep out the Frost.

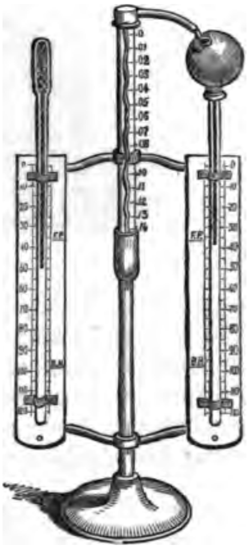
Again, are any of your readers fond of melons, and would like to have some, but dread the expense of a pit or frame? Let him purchase 20 feet of the New Patent Ground-Vinery. Dig out a trench 6 feet wide and 3 feet deep, in a sheltered place. Fill it up with fermenting hot dung or tan. Cover a yard of it with 9 inches of strong loam. Tread it all down evenly and firmly. Place the Protector along the centre; build up the outside as high as the glass, with some leaves, tan, or dung. Wait a few days till the heat rises. If the heat of the dung does not exceed 80 deg., plant the melons. Remove all air every afternoon at two o'clock; water freely. Presuming that the plants have been stopped before planting, allow the shoots to run from each melon till they have met the next: the plants to be planted 2 feet apart. Then stop in the usual way, and reap the reward, which I hope to reap, of two, perhaps four, melons on each plant. —*D. T. Fish, F.R.H.S.*

ATMOMETRO-HYGROMETER.

ANY one who is the fortunate possessor of a garden in the suburbs of our large towns should possess those two simple philosophical instruments, a barometer and thermometer, by which changes in the weather are indicated, and in some degree foretold. The "Atmometro-Hygrometer," combining in some degree the principles of the barometer and thermometer, is the invention of Mr P. Stevenson, philosophical instrument maker in Edinburgh.

This instrument is designed to give, in a simple, accurate, and practical form, all the information desirable as to the temperature and moisture of the atmosphere, and also the rate of evaporation from any wet or humid surface. It consists of a combination of two instruments: 1. The wet and dry bulb thermometers, or what is known as Mason's Hygrometer; and 2. another instrument (not so well known) called an atmometer, invented by the late Professor Leslie, of Edinburgh.

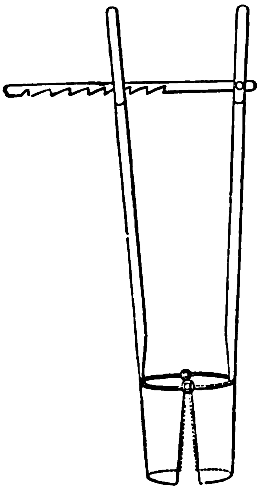
The following is the construction of the new instrument:—A pair of sensitive thermometers, having thin cylindrical bulbs, are fixed on a stand, in an inverted position (as shewn in the wood-cut). This position of the thermometer bulbs gives more perfect isolation from the temperature of the resting-place and surrounding bodies affecting their indications; and they are fixed sufficiently apart so as not to affect each other. One of Leslie's thin porous clay bulbs is fitted to the frame so as to cover and enclose the bulb of one of the thermometers. In the centre of the stand, between the thermometers, a small glass tube reservoir for water is fixed; and a thread of cotton wick, reaching to the bottom of this [illegible] s conveyed to, and rests upon, the [illegible] bulb, which is thus kept continuously supplied with moisture by capillary attraction. The bulb of the thermometer, thus enclosed, is cooled by the evaporation of water from the surface of the porous clay bulb, in the same way, and to the same extent, as if it were covered with wet muslin in the ordinary way, and gives, by inspection, all the indi of the wet bulb thermometer: thes the indications of the dry bulb one together Mason's Hygrometer. Fr indications of this instrument, and by of Glaisher's Hygrometrical Tables, t point, and state of the air as to moi easily obtained and determined.



The Atmometro-Hygrometer.

The glass tube reservoir in the of the stand is furnished with a gr scale. Each degree of water in the equal to one thousandth part of an depth of water on the evaporating su area of the porous ball. These degr accurately determined, upon the plan mended by Leslie, for atmometrical By successive observations of the leve water in the reservoir with the scale o rate of evaporation is shewn. Shoul observations be made and noted dai the daily atmometrical degrees added t give weekly, monthly, and yearly, th of water evaporated, or the amount drainage by the atmosphere from humid surfaces.

M'GLASHAN'S FLOWER TRANSPLANTER.



1.—Section of M'Glashan's Flower Transplanter.

is sometimes an object to transplant ıoice floweringplants or beautiful shrubs height of growth. The ordinary means oyed by the gardener is not sufficient :ct.on against casualties resulting from : operation of moving. When we extract plant from its growing position, we do harm to it at any time, and more particularly when the sap is flowing with extraordinary vigour. At least, clumsy transplanting is always attended with more fatal effects in summer than autumn. There are many notable exceptions, as, for instance, that of Mr M'Nab of the Edinburgh Botanic Garden, Mr Barron of Elvaston Nurseries, and others that might be named, of moving large trees with safety even in summer. No real practical planter is surprised at hearing of transplanting evergreens, such as laurels, hollies, and some others, during summer, with safety; they are much more doubtful of the propriety of interfering with deciduous trees and shrubs, but that too has been done, and done well. Only great care has been taken of the roots, and the best article of carriage at command suited for transference and safe deposit in a suitably prepared bed, with such precautions as mulching the surface and bandaging the stem.

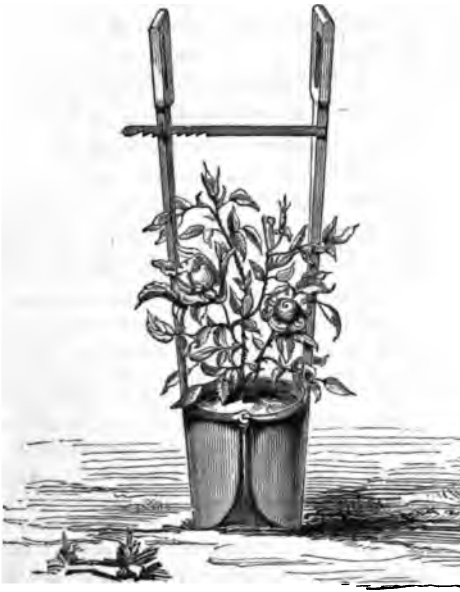


Fig. 2.—Large Flower Transplanter.

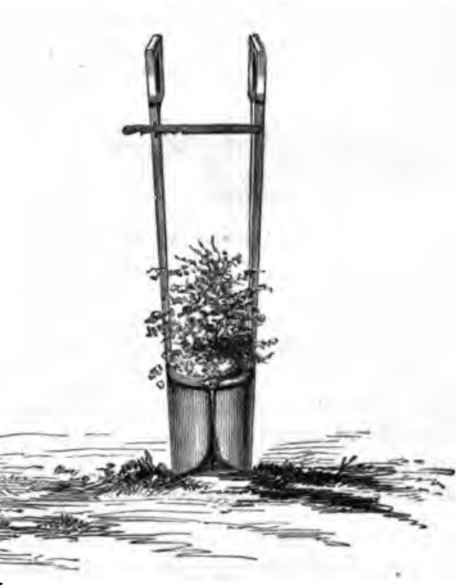


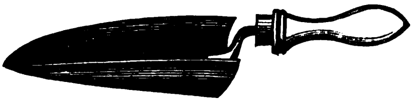
Fig. 3.—Small Flower Transplanter.

For little plants, suitable for even our lady and gentleman amateurs superintending, M'Glashan's comes in very seasonably. Our illustration shews the *modus operandi.* By pressing down the transplanter, or rather lifter, as any one would do a spade, and then drawing the ratchet quite tight, the soil is so compressed that it is formed into a ball, which lifts out readily, and can be replaced into a suitable pit previously made for its reception, without disturbing the continuity of action that is continually going on between roots and branches.

For small plants with little foliage, the transplanter is formed as in fig. 1 and 3, the two portions being hinged. For larger plants, as shewn in fig. 2, the transplanter is formed in separate halves, each resembling a flat spade curved inwards, one half being furnished with two eyes at the shoulders, the other with two hooks. The spade with the eyes is first thrust into the ground, and then the half with the hooks at the shoulders, which are pressed into the eyes, enclosing the plant between them. The handles are then thrust outwards, to the extent of the ratchet, and the plant readily lifted out of the earth.

GARDEN TROWEL.

THIS is an indispensable tool for every villa gardener. It ought to be made use of oftener than we are in the habit of seeing it. Instead of transplanting with a little spade or a flat trowel as we occasionally see under practice, this is the article suitable. It is alike a "fit and proper" tool for a kitchen as well as a flower garden. Many with a rounded, tapered piece of wood dibble in choice plants that would be much better served with the subject of our engraving.



Improved Garden Trowel.

It is a great object to keep the soil open, in order that aeration and a limited rainfall may be properly taken advantage of. By doing so, young rootlets, even of cabbages and cauliflowers and all the family to which these belong, break away more easily and have a better or a more palatable run after they start into growth. The same remarks apply to flower-garden plants. Dibbling in is simply a very imperfect plan of planting. It is desirable to plant or transplant small things, as you would do large things, unless they be very small indeed. And how is that? By preparing a circular trench for them equal in diameter to the size and rooting quarters of the plants intended to be fixed in position. As will be seen by a glance at the engraving, this trowel has been manufactured exactly to meet such requirements by being scooped out, as some of our wits would say to form a semicircular outline. The trowel is so moulded in course of manufacture that by lifting out one portion of soil in one position, and by reversing the position of the trowel in the opposite direction, an exactly circular little trench is formed. One or two more lifts will form the bed or trench, and the roots of the plants are filled in with comminuted mould or soil which water and air easily permeate through. All our gardeners should provide themselves with this trowel. They are to be had in a variety of sizes from any seed warehouse.

Work in the Garden during June.

From "THE VILLA GARDENER."

ummertide ; the weather has reached its
eridian of heat, and all Nature is gradu-
y exchanging the freshness and tenderness
he more sober hues and harder working
, busy summer. Nature has now entered
a great extent superseded, our labours.
reap what we have sown. Our winter
spring care are rewarded with strong
an early harvest of fruit and flowers.
ding—gathering—and enjoying, are the
ons of the month. Of course there are
as guarding the produce from greedy
planting, cleaning, and sowing. For
erations are perpetual in all good gar-
when arrested by stress of weather. The
ous gathering out of gardens is perpetual
"As a man soweth, so shall he also
we must sow other things beside seed.
ance, as skill, patience, taste, and love.
iefly, that ensure bulk and quality at har-
he training of plants is a delightful task,
glected, and more frequently badly done
ns. The secret of success is to begin
ist the plant as little as possible consist-
primary object of all artificial training—
ng it sufficient support. Study Nature, not
but assist her. No plant should be made to
hes if it is strong enough to stand alone.
est mistake about training is the deferring
ate. We must lead the stem or branches,
crush them into form. Ours should be
task to rear the tender plant. To teach
wth how to shoot—not bruise, huddle,
nto form after it has grown. Then as
g—plenty, and seasonable, must be our
al supply of food, and water when it is
no more till it is needed again, is just as
e comfort and well-being of plants, as it
es. In fact, the application of this simple
treating plants as we do ourselves in all
, would result in perfect success. It is
feed upon widely different substances,
that govern supply and demand of or for
h kingdoms are alike. Consumption
ratio of replenishment. Rapid growth,
se, force expended in work or produce,
produce be fruits or flowers, or work of
—all waste strength or expend substance,
ompensation in the form of food. Plants
pplies from three sources—the earth, the air, and the water. We can hardly modify in the way of emptying or refilling their highest granary—the air; but we can give or withold water, and see that their great storehouse—the earth—is filled with suitable food. As succession of gluts and scarcities are most injurious, resulting in a succession of alternate fits of starvings and cravings, and are just as injurious to the vegetable as to the animal kingdom. The plants revenge a want of food or a scarcity of water, by giving us light weight, short measure, or bad quality. I repeat, feed regularly and bountifully, and your harvest will be long, and the field distinguished by bulk and quality. As to the gathering of produce, see that it is done at the right time, and that the mode of doing it is tender, neat, and cleanly. I have seen even ladies cut a flower as if they would tear a plant up by the roots, and others cut a branch off so gently that the most sensitive plant in the world could hardly have felt the shock. This gentleness of gathering should extend to everything. Even cauliflower should be tenderly beheaded, and peas gathered as if they might not like being torn from the stems.

In regard to fruit, tender gathering is essential to prevent it being ruined by blemishes. Neatness is the result of tenderness; no torn or bruised stems, no plants rooted out, nor others trampled to death, or untidiness, will appear in the track of the tender gatherer of garden produce. I have seen strawberries trodden under foot, the ground between peas strewed with empty pods and torn leaves, and great foot-marks imprinted on the crowns of lettuces, spinach, or fresh clean parsley, behind the slovenly and untidy gatherer of such things. All such slovenliness should be alike unseen and unknown in villa gardens. All potato tops and lettuces and cauliflower leaves should be cleared off as soon as the produce is gathered, and neatness—scrupulous and perfect—reign around.

Again, the mode of gathering must be cleanly, with clean hands, into clean baskets or dishes, in a cleanly manner. This is all so obvious as to need no comment. But still, it is not so strictly and carefully attended to as it ought to be. As to the manner of cleanly gathering, a hint or two may be useful. All small fruits for dessert should be gathered by the stalks, and strawberries and raspberries with the husks on or in. They should be laid, as gathered, in baskets, on clean cabbage or cauliflower leaves, having their mid-ribs cut out to make them lie flat; or on soft tissue paper, one fruit thick. Every fruit bearing traces of slugs, wood-lice, or maggots, should be rejected, as also all soiled fruit. In dishing the fruit for table use, clean leaves, either of their own, or vine leaves, or indeed any tree leaves, such as sycamore, lime, &c., that will not flavour the fruit. Cherries or plums should likewise be gathered and sent to table with the stalks; peaches, nectarines, and apricots tenderly gathered and placed softly on downy beds of cotton wool in boxes or baskets, and sent to table unsoiled and unbruised.

The same attention and tasteful serving is equally essential with vegetables. No dust nor dirt must soil cauliflower, touch lettuce, nor mess curled parsley. All these should be laid on a bed of clean leaves, and every care taken neither to soil nor bruise them in transit from garden to table.

The time of gathering is most important. With fruit, rather before than after ripeness; with vegetables, when they are young, crisp, and tender. With flowers, the moment the bud is one-half or three-fourths expanded. In flowers at this stage we have the pleasure of hope, and of the full enjoyment of their beauty, apart from those of regret that they must so soon fade, which is inseparable from the sight of full-blossomed flowers. As to the enjoyment of garden produce, most of our readers will do that in their own way, write what we may; but the best prescription, for solid lasting pleasure to all, is a pure mind and a grateful heart. The first makes us enraptured with the things to be enjoyed, and the second gives alike the capacity and the will to enjoy them. The produce and beauty of the garden spring forth from the earth, but the capacity of enjoying either is of the soul, or drops down like the refreshing dew from heaven. It is only thus that "a thing of beauty is a joy for ever."

Filled with such thoughts, every reader may find his garden just such an Eden's bower, of satisfying, unfailing quiet gladness, while performing and enjoying the work of this month.

KITCHEN GARDEN.

This is often a dry month, and one of the first needs of growing vegetables—water—must be provided in such plenty as to saturate the earth down to the lowest rootlet. Celery, peas, asparagus, cauliflower, cabbage, brocoli, turnips, lettuces, can hardly make way against a July sun without such copious waterings; or if they do, they will prove stringy, tough, and worthless. The French are famous for the crispness and sweetness of their salads and vegetables—their summer climate is not equal to ours for growth, but they at once meet the fierce glare of the sun at all points with the watering-pot, and the result is rapid, tender, succulent growth. Nine-tenths of most vegetables are sheer water, and water they must have. With water in plenty, July vegetables are as good as any; without, they are often not worth eating. Plenty of water is needful for all growing crops, but it is essential to the life of those that are newly transplanted. As a good deal of the latter has to be done this month, choose a showery time for it if possible; but if not, you must make your own showers, with hose or watering-pot. To plant out cauliflower, brocoli, Savoys, Brussels sprouts, Scotch kale, or celery, and leave the plants to languish for want of water, is to lose weeks of the best time, if not the crop itself. All such plants should be carefully pricked out of seedbeds into other beds, say 3 or 4 inches square. As soon as the plants are large enough to handle and grow, transfer them into their growing and finishing quarters, 2 feet square, or 2 feet by 18 inches. A few cabbages may also be planted for autumn use, by those who prefer cabbages to cauliflower or Walcheren brocoli, if there are any such. For many years we have only planted one lot of cabbages about the end of September. These in succession stand the winter, and come into use in May. A great fault in the cropping of most villa gardens is an excess of cabbage. A dozen of cabbages to one cauliflower or brocoli is a common enough proportion. I would reverse these proportions in favour of the cauliflower or the brocoli.

Plant out *endive* and *lettuce* for succession.

New potatoes may be had nearly all the year by simply extending the planting season from November to August, and putting a few in at intervals of six weeks or two months. Most of these plantings are better than one sort of new potatoes sold in quantities in the markets of Paris. Earth up advancing potatoes, and soak the whole mass of roots or tubers through, in dry weather, with house sewage. This is both a sure and certain mode of transferring small potatoes into large ones, or of hastening the formation of small ones. If potatoes are matured before the drought has severely checked them, there is no danger of second growths ruining the quality of the tubers. But after they have suffered much or long from drought, the watering may do more harm than good.

Make last sowing of *peas*. It is well now to sow a row or two of late and early varieties. These crops are somewhat precarious, but late peas are valuable, and they are always worth trying for. Carter's First Crop, Knight's Dwarf Marrow, and Veitch's Perfection, are good sorts to sow now. Place the seed in sheltered trenches, cover the ground on each side of the peas with 2 or 4 inches thick of rotten manure or short grass, to keep the heat out and the moisture in, and never let them want for water, and you may gather peas from this sowing right up to Christmas. The litter on the surface is called mulching—a cultural aid of the first importance in the growth of all plants in dry weather.

Sow turnips and small salading, such as lettuces, endive, radishes, and summer spinach. Prepare a piece of rich ground for winter spinach. Sow Walchern brocoli, parsley for winter supply, and a few Horn carrots for drawing young in the autumn; also a few dwarf kidney beans for a late crop. Stop and thin ridge cucumbers.

Vegetable Marrow or Tomatoes.—Keep hoeing among all growing crops, and proclaim war to the death to all weeds.

Last month I promised a receipt for growing bad it is :—Pull up the plants roughly from bed, leaving many of the best roots be- off the ends of a few of the strongest lance matters fair with the roots, plant renches on a sunny day. Sprinkle the ad with water to anoint their wounded ieir flagging leaves. Give them another ing in a fortnight. As soon as they have inches, begin to earth up the stems and ig so at intervals of three weeks as fast can grow. Before each earthing, water last earthing, and earth up immediately ater in. Be careful in all your waterings driblets, and never enough to reach the eceipt is warranted good for making bad iting its growth, making it hard, tough, d sending it into seed. Those that want ave only to reverse the picture. Trans- oot entire, wash it into its new home, every root even to its utmost depths. At g, never let it be dry, and don't encum- i with any earth until within three weeks ou want to eat it. Before earthing up, ickers and a few of the outside leaves, ld the celery with one hand, or tie it firmly le the finely broken mould is tightly com- l it, with the other, and your celery will id as strong as a man's arm, and almost rod of glass.

THE FRUIT GARDEN.

ither water the tops and bottoms of all l bushes, the roots with manure water or he tops with dashing showers of clean ie hose of a " main " or a garden engine. remedy for most of the weaknesses and such trees are heir to. Presuming that s well drained, it is almost impossible to iring this month. The strain upon the mous. Fruits have to be swelled off, on, seeds perfected, and wood formed. ese are consumptive processes, and so v material is needed to keep up the sup- oist bottom and daily washed top make vith enemies—red spider and green fly. tter cannot long bear up against succes- gs with cold water. Persistent washings ich pests or make them flit to drier and ers. Mildew, again, is much oftener the ought than of moisture throughout these few sprinklings of sulphur after these ll destroy it also. Should, however, k fly still be found anywhere, dose it to tobacco water, quassia tea, or other npounds, or treat it—like a young lady -to a strong dose of smelling salts, or a in church to a pinch of snuff.

he liberal feeding or cleaning the trees, of the fruit is the most important work h. This should now be completed by the removal of all the small, deformed, or insect punctured fruit, and the thinning out of the sound and good ones to reasonable distances. Observe I use a flexible term—reasonable. Every reader will doubtless put his own interpretation upon it, but surely it is more reasonable to have one good fruit than six small worthless ones. The more you thin, the larger and finer will be the fruit left. On walls, no two fruits, such as peaches, nectarines, nor apricots should touch each other. Distances ranging from 4 inches clear to 12 inches, should intervene between the plums, and cherries may be left thicker, but the clusters of both should be reduced to from 4 to 6 on each. Choice pears on walls, espaliers or pyramids, ought not to be left closer than peaches. Apples may be left closer together than pears. On cordons, where the entire root power is concentrated on a single rod, the fruit may be left tolerably close. The young shoots on cherries called heartwood may be thinned out, only leaving as much as is likely to be needed, or as room can be found for, but not nailing it in for the present, as it furnishes a useful buffer to keep the nets, &c., from the wall, and the wood gets stronger, and the buds for next year's crop more plump, when left as recommended. Weak growing peaches, plums, and apricots may be strengthened by the same simple means—that is, by leaving the young wood unnailed or untied. On stronger trees all such growths should be fixed to the walls, as recommended last month. In fact, this thinning and fixing in of the wood, and the removal of superfluous fruits, and keeping of the trees watered and clean, form the chief work in the fruit garden throughout the summer months.

Ripe fruit will of course be kept from the birds and other insects. Nets suffice for the former, but earwigs, wasps, flies, and even ladybirds are far more difficult to deal with. For all these there is no remedy equal to that of the tedious one of "catch 'em alive, oh!" For this purpose various traps are used. Hollow reeds placed all about the wall, under the branches, and emptied every morning, form the best traps for earwigs; bottles filled with beer and sugar for the wasps and flies, and hand-picking for the lady-birds, which have become a great pest, forming a red-coated army of fruit devourers last year, and have put in such an early appearance this season.

Thin out the young shoots on raspberry stools, to from 3 to 6 for each, and tie those selected to the stakes, to prevent their being broken. Strawberries will of course be gathered as soon as ripe, and runners laid for forcing, forming other plantations. It is a good and simple plan to lay these in small pots of rich earth. Place the runners on the top of the soil, and press the little plants on the end of it firmly down, and put a small stone on the runner—not the plant—to keep it firmly in position. In dry weather water the small pots. This mode gains a fortnight at least of time, which is a most important matter for next year's crop. Where no increase of plants is needed, cut all runners off, top dress, and well water the plants, to enable them to prepare a plentiful crop for next season. As soon as the runners are well rooted, plant them out in rows 2 feet apart, and 15 inches from plant to plant, and see to it that they have plenty of food and water, if you want to gather fruit the succeeding year.

Vines.—Stop the bearing shoots at every additional leaf made. Tie in leading shoots, that is, the young wood left to fruit next season, thin out the branches to a fair crop, never leaving more than one on each branch, and also thin the berries, removing at least two for any one left, if you wish them to be large. This is done with what are called grape scissors. They are long and narrow in blade and handle, so that they can be readily used without the hand coming in contact with the grapes. Grapes in a young state are thin skinned, and should never be touched with the hand if possible. With the aid of a small stick, like a lea tedding stick in miniature, to hold and turn the bunch with, grapes may be thinned without the fingers or hand touching them at all.

Water figs abundantly in dry weather; they cannot be over watered while the fruit is swelling. The roots are gross feeders, and the leaves can absorb and dispose of any amount of water. Gather all fruit before it is dead ripe, and all intended for the day's dessert early in the cool of the morning. See and keep it in a cool place till consumed. Few sensations are more unpleasant than the eating of luke-warm fruit, which is the penalty of gathering desserts in the afternoon. The mouth seems filled with stale sunbeams, flavoured with strawberries, apricots, or peaches. Fruit eats much fresher if gathered in the morning, and kept cool for the day, than if taken direct from the hot ground, or hotter wall, to table.

THE FLOWER GARDEN.

The first want of the flowers will probably be water this month. Supply it in the afternoon or evening, and do it thoroughly when it is done; and water not only the flowers, but the shrubs, the trees, the grass, and the gravel, if in your power. Few things contribute so much to the real enjoyment of a garden, large or small, as to turn from the heat and dust of the outside street or roadway into the freshness and greenness of the villa residence. As water mains will generally lie near, or, it may be, pass your garden, I would advise my readers to have the water laid on. The pleasure in dry weather of attaching a hose to a main, and sending a stream of sparkling water over and on to the top of young trees and shrubs, is worth a hundred a-year to any lover of Nature. Near cities it may generally be enjoyed for £2 or £3. In washing and watering the plants we refresh ourselves; and the pleasure of seeing glossy leaves, and healthy strong growth, while all around are drooping for rain, and begrimmed with dust or dirt, is one of the richest within the whole range of my experience. And the same may be said of green grass, and moist, firm, cool gravel. What can be more wretched for ladies or gentlemen, in their boots or slippers, to walk in the cool of the morning or evening on hot gravel? Water it well, and roll it firm, and it becomes as cool elastic cushions, most refreshing to the weary feet. The very smell of watered earth, gravel, green, and growing leaves is worth all the trouble. It is likewise essential to the health of the plants, and the high keeping of the grounds.

Roses.—Look after the grubs, green-fly, and mildew. For the latter pest, dust all over with soot. It is cheaper and less offensive than sulphur, and equally effective for caterpillars. Guard against weighty rose buds breaking off the young branches; top-dress the beds with guano, or saturate them with sewage, to induce a strong new growth for autumn blooming. It is a good plan to cut back every perpetual flowering rose shoot to three buds from its base. Successional cuttings will yield flowers in rotation throughout the season. This is important in all gardens, but especially in small ones, which ought never to be roseless, if it can be helped, from June to November. By growing a a few of the best tea or China roses, and thus cutting in hybrid perpetuals, the season of roses may be made continuous. Attend to climbing roses; fix in the long, strong, new shoots, and thin those away that are not needed. Push forward budding, and complete it, if possible, during the month. Full instructions for budding, and the after treatment of bud and stock, will be found in this and the June number. Encourage a fine strong growth in the flower buds. Train, peg down the plants as they require it, and pick off any dead flower before it has time to exhaust the plant by seed-bearing.

Sustain the strength of hollyhocks with frequent soakings of liquid manure, and stake them up early.

Stake dahlias with care, and thin out the shoots.

Encourage the growth of stocks, asters, marigolds, zinnias, phloxes, delphiniums, and all strong growing plants. Carnations and picotees should have their buds thinned out to one or three on a head, and be shaded from the sun, if perfect flowers are desired. For border flowers, all buds may be left, and they will only need the support of stakes. Towards the end of the month they may be layered. The operation consists in cutting the under side of a branch of the plant half through below a joint, pegging it down, and raising the head of the branch, so as to open the cut; then cover the wounded part over with 2 inches of sandy soil. The layer is, in fact, an attached cutting. It throws out roots from the surface of the cut; and when these are sufficiently advanced to sustain the plant, the other half of the branch is severed with a knife, and the plant begins its independent existence. Pipings of pinks may still be put in, rooted plants planted out, or seeds gathered and sown.

Pansy seed may likewise be gathered and sown, rooted cuttings planted out, and the best blooms shaded, if perfection of colour be wanted. To ensure continuous blooming they must be kept well watered;

oom at midsummer cannot by any means be
equal in size, brilliancy, or substance, their
oms in April or May.
f all kinds must be taken up, and stored away.
ping of the grounds, the dress of the flower-
ss, gravel, must be perfect, and the mowing
broom and roller, follow in the track of the
pot.

PITS AND FRAMES.

to the stopping, thinning, setting, swelling,
ng of *Cucumbers* and *Melons*. Cut all melons
s they smell strong, and place them in a dry,
ce for a few days to finish. When the stem
crack round its base, the colour to look
nd, chiefly and above all, the scent is fulsome,
is no longer safe in the pit or frame. It
ice to all marauders by night or day that
g wonderfully good is there, and such tempting
almost sure to be taken by rats or mice, or
rmin. At this final stage, too, the melons
split asunder by damp, or a strong current
d a rent melon is not a presentable object at

to balsams and cockscombs, of sorts, in their
Shift into larger pots as they grow, keep-
tem as low as possible at the pot-bottom, so
e the plants dwarf. Keep the plants warm
ng up early in the afternoon, after sprinkling
e surface of the frames and the plants with
Pot off Chinese primroses, cineraria, and
ias for winter or spring blooming. The two
y also still be sown.
sert cuttings of choice antirrhinums, phloxes,
rs, stocks, rockets, pyrethrum, &c., &c.
oice auriculas and polyanthuses, if not already
d keep close in cold frames till re-established.
ots of chrysanthemums.

THE GLASS HOUSE.

Shade pelargoniums, fuchsias, and all plants in flower, from the glare of the sun, to preserve their colour and prolong the season of flowering. Keep out humble bees with screens of thin gauze over the ventilating spaces, else these fat, lumpy sweetie-hunters will speedily keep down all your best flowers. Fancy pelargoniums may be killed by an excess of water. When they are in flower give abundance of air, and let no insect live under glass.

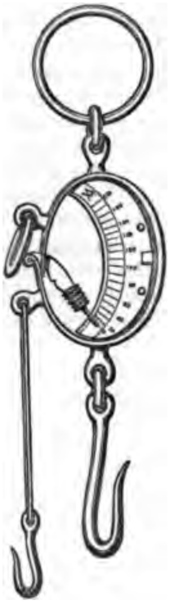
Camellias should be shifted as soon as their blossom buds are fairly set into cool quarters. Late fuchsias and plain and variegated zonal geraniums may also have another shift for late blooming. [For small houses they look best in 6, or at the most 8-inch pots. The latest plants of these should be grown out of doors, and have all the flowers picked off till the end of August. These might be stopped now, that is, the centre of all their shoots nipped out. Each branch will then break into three or four; and when all these flower together in the autumn or early winter, they make a blaze of beauty for months together in the Glass House when flowers are most needed.

Give abundance of air; keep floor, shelves, stage-pots scrupulously clean. Train climbers, or rather allow them to run into elegance and grace, and your Glass House cannot fail to prove a constant source of interest and a sweet place of pleasure. The sweetness is readily ensured by growing a few night-scented stocks, pots of mignonette, and some heliotropes for this special purpose. And if you could also have a tea rose, such as Devoniensis, running up a pillar, or the climbing variety scrambling along the roof, and the Mandevilla suaveolens bearing it company, you have such an aggregate of perfumes of the most pleasing varieties. No Glass House, large or small, can be thoroughly enjoyable, unless the eye is pleased and the sense of smell satisfied.—*D. T. Fish, F.R.H.S.*

The Apiarian.

TAKING HONEY AND WAX FROM BEEHIVES.

IT is not difficult to know pretty accurately how much honey is in a hive before the bees are removed from it. Here is an illustration of a German steelyard, which is a handy instrument for weighing hives. The dial or plate is figured on both sides—one side for the large central hook and ring, numbering from 1 lb. up to 200 lb. The other side indicating from 1 lb. to 40 lb. only, is used when the hive is lifted by the small hook and ring seen on the left-hand side.



German Steelyard.

To ascertain how much honey is in a hive, we have a rule or standard of calculation which comes near enough to certainty in this matter. After deducting the weight of hive, board, and bees, we reckon 5 lb. of honey for every 7 lb. weight. Suppose a hive weighs 60 lb. The hive and board may weigh 10 lb. jointly, and the bees 8 lb., leaving 42 lb. In this case there are 30 lb. of honey and 12 lb. of offal or refuse combs. Another hive may weigh 100 lb., the hive, board, and bees, of which may be 23 lb.—eaving 77 lb. According to our standard there would be 55 lb. of honey [illegible] offal. In the case of hives containing old combs the yield of honey is less in proportion to weight than it is in young or virgin combs. Again, if the brood be all hatched, there will be less offal and more honey. And we need not add that the yield of poor lean hives will be found wanting; and that in the yield of very fat o
will be found a surcharge of honey.

But let us come to the process
honey. As soon as the bees are dr
the honey-hives should be carried int
room, and not allowed to cool, for
difficult to impart heat to honeycom
sticks crossing the combs are withdr
pair of pincers, the combs removed f
hives, and the honey portions of tl
fully cut off and placed on a flat dish
pan, standing near the fire, but not s
to melt the combs. Any pure wh
may be set aside for sale as it is, an
rest containing honey be broken
knife, and then put into a bag of che
or thin towelling, to drain off intc
placed underneath. The honey thu
is as pure as it possibly can be, and
better than if pressed out of the com
hands; for honey so pressed or squ
is impregnated with the taste or f
farina or bee-bread, and is slightly di
by it. We very much disapprov
hand-squeezing mode, for though i
the greatest weight of honey, it does
expense of quality. In taking
flower honey, no squeezing is a
necessary; but in the case of heat
some pressure is required, for it wil
without it.

We have seen instruments for
honey from combs. Though smal
perfect, they did their work well,
process was slow and tedious. We
hope that the ingenuity of some b
will soon furnish us with an instrum
will enable us to take hundredw
honey from combs easily and speedi

We are sorry that we cannot

er one useful hint in the matter of ex- ing honey from combs, for every old ıan in the country is as well posted and mplished as the author; indeed, it is a tion if the people of the times of Methu- ı were not quite as well up in this work e are. We are earnestly seeking for a that will save both time and toil in this ness.

ter all the honey has dripped into the el and been skimmed, it is ready for .

'ax is obtained by putting the refuse bs into a bag of cheese-cloth, and boiling them in a large pot of clean water over a slow fire. If the bag be pushed to the bottom of the pot, and held there by some contrivance, all the better. The wax speedily comes to the surface of the water, and appears there as a beautiful yellow oil or fat. This oil is ladled into a bag of fine cloth or strainer, through which it passes into vessels. The wax may be boiled again in clean water, and put through the bag once more, and thus become purified. Combs that yield £10 worth of honey, yield rather more than £1 worth of wax.—*Pettigrew's Handy-Book of Bees.*

The Dairy and Poultry-Yard.

ALDERNEYS IN THE HERD-BOOK AND OUT.

HAVING been in at the birth of some calves of the Alderney or Jersey family, in the old times when gentlemen bred from imported or home-purchased specimens, without thought of keeping a record of the connexion of the branches with the family-tree, I am now importuned to furnish information of certain bulls, cows, and calves, by those who have, in the course of trade and breeding, become interested in their progeny.

Inside the herd-book, a Jersey or Alderney calf may be rated at 200 or 250 dols.; while I am told by a prominent breeder that an outside animal without blemish, answering in every point but the written record, is "worth no more than a common calf."

Here is matter for reflection. It is of vital importance that stock-raisers learn to value purity of blood; and cattle-breeders' associations are doing right good service in inciting the public to preserve and prize the good qualities in a family of animals which are fixed by time. Let us by all means register, name, and number our stock. There is no fear of time or printing-ink failing for this purpose.

Meanwhile, there are fragments worth the saving. There are families of Jersey and Alderney cattle, which only by a stretch of courtesy can be entered in any herd-book that calls for a clean record to the salt sea—cattle, too, that no one doubts are thoroughbred, any more than he doubts that the [illegible] from runs to [illegible].

Another commercial [illegible] there may be too strong a leaning [illegible] value of the record merely. Does the [illegible] secretary of these associations answer for the intrinsic value of a herd-book calf? Probably not. His cognizance can only include the fact of direct descent from imported stock, leaving a possible chance that the calf in question may be an inferior specimen, not really worth the recorder's fee. While we keep a tight clutch upon the good we have got, let us not forget that though a full purse may purchase a fine start in stock, nothing but the artist eye, trained to a love of perfection, following its end for years with patience, can secure proportionate results. I would rather see Jonas Webb's spirit prevalent than to see better flocks than his ever were imported by wholesale.

What makes the Jersey cattle valuable? The islands in the English Channel, upon which they originated, are scarcely of more importance than those in Narragansett Bay, or Nantucket and Martha's Vineyard. Cow-keeping became of importance as a method of turning grass into money. Butter was the one thing, as in thousands of households in America now, which farmers could the easiest make an article of trade, giving employ to themselves and their families.

Cattle-breeding upon islands between England and France, one hundred and fifty years ago, was attended with some difficulty, unless the farmer was content to make the best of what he had. Butter was portable. Bulls were not, and a system of breeding in-and-in was a necessity. With a sharp eye to the cream-pot, these cattle have been produced. Beef was secondary; so were working qualities, there being no logs to haul to the saw-mill. An animal was produced with legs to carry about a sound stomach, and large paunch, and a tidy milk-vessel, with a thin, yellow skin, and spotted colours over all. If the wives and children of the peasant farmers loved their work—as why not?—pets were made of these kine — docility developed. People of taste upon the mainland found a

nd peculiar fawn-like beauty in these
and carried it home with them. It
fashionable, and a very worthy and
t fashion for the ruralists of England
eir lawns and pleasure grounds with
otley-coated cows. Here was an
as beautiful as a deer, as innocent as
that would furnish yellow milk for
coffee, and a golden pat of butter for
kfast-muffins. Plain cow-keeping in
m !
want beef and work, take some shorter
it than by the way of the butter-cul-
he English Channel. In any neigh-
d where fine butter is appreciated, try
the Jersey cattle, study their peculiar merits and breed them. (I should like a thinner udder and longer teats, for instance, unless the girls will do the milking, as they doubtless did over the water). Obtain pure blood, and think enough of it to knock an occasional degrading runt in the head.

If you have a love of the art of breeding—for it is an art, and a high one—you may make the recorders flock about you in a short life-time, begging an insight into your methods. An entrance into the herd-book is well, but it is not so important in the history of animals as was the entrance into the ark.—*Hearth and Home.*

DOES SOILING COWS PAY?

IT INCREASE THE YIELD OF MILK?

dairyman's first question will be : Is it
vourable to the production of milk? He
s that this mode of stall-feeding through
m season will be so new to his cows as to
sly affect the yield of milk. But his fears
groundless.

feeding in summer is no more injurious
winter, as the cow may have all the
she is inclined to. Our experiments
at a cow will average about one-fifth
ilk in soiling than pasturing. The food
uniformly abundant, while pasturing is
ry flush and then very meagre. R. L.
o practised this system many years, said
doubled the quantity of milk from the
ws; and Mr Quincy says it largely in-
the quantity of milk in his cows. But we
ok to the patient Prussians in this, as in
ther matters, for the most accurate ex-
ts. Dr Rhode-Eldena, of the Royal
y of Agriculture of Prussia, published an
ent in 1867, extending through fourteen
seven of pasturing and seven of soiling.
sturing began with 1853 and ended with
nd the soiling began with 1860 and ended
66.

forty to seventy cows were pastured
ear, and a separate account is kept with
w. The lowest average per cow is 1385
in 1855, when seventy cows were kept,
and the highest, 1941 quarts in 1859, when forty cows were pastured; and the greatest quantity given by one cow was 2938 quarts. The average increased, during the last four years, from 1400 to 1941 quarts. The average per cow for the whole seven years of pasturing was 1583 quarts.

In the soiling experiment, twenty-nine to thirty-eight cows were kept, and the lowest average per cow was 2930 quarts in 1862, when thirty-eight cows were kept, and the highest average per cow was 4000 quarts in 1866, with thirty-five cows. The highest quantity given by one cow is 5110 quarts in 1866. The average per cow, for the whole seven years of soiling, was 3442 quarts. The yield of the same cow is compared for different years. Cow No. 4 gave, in 1860, 3636 quarts; in 1863, 4570 quarts; in 1866, 4960 quarts. Cow No. 24 gave, in 1860, 3293 quarts; in 1863, 4483 quarts; in 1866, 4800 quarts. Here it appears that, through the whole seven years of soiling, the average yield of the cows was more than double what it was during the seven years of pasturing. This is, however, partially explained by the fact, that in 1860, Mr Hermann, the keeper of the herd, discarded all his poor milkers, and supplied their places with superior Dutch breeds. He fed in summer, green clover and vetches, in the fall seradella (a green fodder), and, in addition, some oil-cake and rye-bran. It is evident he was a high feeder. A most notable feature, also, is the increase of the same cow from year to year. This should be noted for several reasons—First, it shews that cows remain healthy through seven years of stable-feeding; second, that persistent high-feeding will be remunerated by a steady increase of milk. On the whole, this is the most remarkable experiment on record of the comparative yield of milk by pasturing and soiling, and settles the question most conclusively in favour of soiling.

We cannot, probably, claim all the gain here exhibited as referable to soiling alone—that is, to feeding abundant grass in stalls, instead of allowing the cow to crop it for herself in the pasture ; but it will be a very moderate estimate to say that soiling increases the yield of milk one-third. Thus we see that the increased production will pay the extra labour of soiling twice over. One advantage of soiling over pasturing is explained, perhaps, in the process of digestion. It is claimed that "digestion never proceeds rapidly as long as the animal continues eating. It is only when the stomach is sufficiently filled that the circulation becomes accelerated, the temperature of the body more elevated, and digestion proceeds with the greatest activity." (*Rural Cyclopædia.*) We may infer from this, that when cows forage all day over a scanty pasture, digestion proceeds very slowly, and is accomplished less perfectly than when abundance of green food is given in the stall.

WHAT FENCES COST.

This question of fences presses more and more upon the farmer every year. Some method of avoiding the expense of fencing must soon be devised, or it will become a burden too grievous to be borne. Suppose a 300-acre farm to be divided into 20-acre lots, and if we credit the adjoining owners with one-half of the division fences, we shall require 1720 rods of fence to complete the enclosure. In the older settled portions of the country, a good fence will cost 6s. 3d. per rod at the cheapest, consequently amounting to £537, 10s., the interest of which is £37, 14s. 6d. Counting the annual repairs at five per cent., and the decay at five per cent., makes £57, 11s., which, added to the amount of interest, makes an annual outlay of £91, 0s. 11d. Now this farm would be capable of pasturing and wintering fifty cows and a team to work it. According to our figures heretofore given from experiment, one man could cut the grass, feed and care for these animals; and if we estimate his labour at 7s. 6d. per month, the cost of soiling would be only £43, 15s., or less than half the expense of fencing. The fences on this farm would occupy about five acres of ground, which, if put in good condition, would soil ten cows. Where soiling shall be generally practised, no fences for enclosing farms will be necessary. The convenience of passing into and from fields, and of ploughing them, without the obstruction of fences, will be very great. Fences are also the cause of propagating foul weeds over the farm. After long experience, we say, unhesitatingly, that we would not have a farm for our use fenced with the best materials, if offered to be done gratuitously.

SOILING SAVES MANURE.

The saving of manure is also an important consideration. Feeding animals in stalls offers the best facilities for saving all the droppings under cover ready for application to the fall crops. It will readily be seen that this manure will be worth double the same droppings in the field, dried and exhaled by summer exposure. Then by this system double the number of animals may be kept, and thus the manure is multiplied fourfold. Mr Quincy, from experiment, estimates the manure from a cow as worth £1, 17s. 6d. for the six soiling months, and Professor Johnston says the liquid and solid manure from a cow is valued at £4, 3s. 4d. per year in Flanders.

Then, in soiling fifty cows—a number which would require the labour of one man—the manure, at Mr Quincy's estimate, would be worth £93, 15s., and one-half of this would be £46, 17s. 6d., which would more than pay the labour.

SOILING SAVES FOOD.

Every farmer has observed that much of the grass of a pasture is injured and lost by the treading of animals, by lying upon it, by dung and urine. This waste cannot occur in stable-feeding. We wish, also, to call the attention of farmers to the fact, that this system utilizes weeds, as well as destroys them. Animals will readily eat any of the ordinary weeds mixed with grasses, when cut for soiling. Young Canadian thistles, mixed with grass and run through a straw-cutter, are readily eaten by horses. Cutting weeds, frequently, when young and tender, will kill them. Even white daisy is not to be feared in a soiling crop. They will be eaten freely. This system will make clean farms.

GENERAL MANAGEMENT OF POULTRY.

INCUBATION.

ERY important point to be observed in
setting eggs for hatching is, to correctly
rtion the number of eggs, taking into con-
tion their size to the size of the hen about
upon them. The state of the weather
l also be a guide; for a hen capable of
upon and hatching thirteen eggs in June,
ld not be safe to give her more than ten
uary. The great error of setting a hen
more eggs than she can cover is a cause
eral disappointment. We have frequently
mall cross-bred game hens set upon thir-
ggs, when it has been perfectly clear it was
ssible for them all to receive a proper and
share of heat from her body, and it is
tely certain that a hen cannot hatch out
ns from those eggs which she cannot draw
up to her body. This has been very clearly
strated to us, for upon one occasion we
l fifteen eggs under a hen, not safe at any
to have given more than twelve, or at
st thirteen eggs, and whilst out at feed-
ne, we examined the nest and found only
n eggs left. We at first thought she
have eaten them, but after one or two ex-
tions we found sometimes thirteen and at
imes fourteen eggs present, so we deter-
upon catching the hen one morning
off to feed, after finding there were only
n eggs in the nest. We cautiously laid
f the hen, when she unfortunately dropped
g and broke it; upon examining her we
the other missing egg under her wing.
placed the eggs in the nest, and we found
ularly removed one or two of the eggs;
was apparent that she had more eggs
her than the surface of her body could
y cover by contact. This marvellous power proved the existence of two wise laws; the first being the beautiful principle we term instinct; the second the ardent desire they have for carrying out to the fullest extent the remarkable operation we understand as incubation.

It is quite unnecessary to remind our readers further upon the necessity of giving the sitting hen rather a limited than too great a number of eggs. Thus, it may probably occur that a small half-bred game hen may be your choice for a natural incubator, if so, nine of her own eggs should be the extent; if a Dorking or a large size mongrel hen be selected, eleven are sufficient; a Cochin hen of some of the strains we have seen will even cover fifteen of her own, or similar size eggs; but even in this instance, it is best to err on the safe side, and give her but thirteen eggs. Cochins and Brahmas have a large width of breast and a large amount of fluff and feather, both features being highly conducive to successful hatching, by assisting to retain the heat of the body of the birds and the eggs also.

There are some hens over-anxious about the chicks within the shells, whose cry for deliverance they can distinctly hear, and do not rise from off the eggs during the process of chipping; this is an operation we have continually observed with hens that are very successful in hatching, whilst those which sit too closely at the last stages, are those whose excess of kindness has just produced the non or limited success in hatching out good broods. The only good arising from any sprinkling of the eggs occurs from the fact of their having received an increased and life-saving supply of fresh air during such process, which in many instances would otherwise have ended in the chicks either being suffocated or glued to the shell.—*Land and Water.*

The Country Gentlewoman.

LETTERS TO FARMERS' DAUGHTERS.

VIII.—BENEVOLENCE.

MY DEAR GIRLS,—The little rivulet in yonder pasture receives a gift from the spring upon the hill-top, and passes it down to the babbling brook. The brook with happy voice carries its increase to the river, the river runs with its gifts to the sea, and heaven descends to gather the vapours from the sea, and send them down again in gentle showers to enrich the earth.

'Tis only man that gathers to hoard and keep; accumulating for self and treasuring superfluities even with a close shut hand.

Receive a lesson from the tree at your door. The roots impart of their strength and sap to the trunk and branches, which in turn give of their juices to the tender leaves and succulent fruit; and they, what are they for, but to minister to your comfort and cheer?

Closeness and meanness are sad to behold in a man, but in woman, who should be an embodiment of that charity which "seeketh not her own," is a spectacle from which angels might well veil their faces. There is a dwarfing, narrowing process going on in that heart which never thinks of doing good to others. Life and labour, and a profitable business, are not given us that we may gather merely for our own comfort and benefit. The largest proportion of the world are in poverty and suffering. Humanity is a brotherhood, and God our common Father, and all we have is His. He says, share with thy needy brother. [illegible] ou ask, to whom shall I give? One [illegible] d, "The poor ye have always with you,' and indeed it would be difficult to get beyond the reach of those who are not needing in some shape. Thousands of children are growing up in sin and poverty, to whom your country homes would be a paradise.
Many are disabled by disease and acci
who have a right to life and support;
are struggling for daily bread and sh
whom a timely word and helping hand
save from vice and misery. Then the
ence of institutions for the public good,
the efforts on foot for the evangelizati
the world, call loudly for aid.

Each one of you, my dear girls, sta
on the threshold of womanhood, should
some cherished plan for usefulness. P
over it, plan for it, deny yourselves for i
give and spend, and God will lend. Be
lence does not *always* consist in g
"Charity begins at home," is very true
there is danger of harping on this
"God loveth a cheerful giver." Give, an
shall receive into your own bosoms
measure, pressed down and running
And if it cost you some sacrifice to *giv*
do, so much the better, you will be the
for it. That benevolence which shews
in a self-denying act, bright smiles whe
heart is heavy, tender words to the opp
and suffering, *all* can give without me
"The *least* flower with a brimming cu
stand and *share* its dewdrop with anoth

If you would possess a symmetrical c
ter, if you would be that which God ap
and angels love—if you would have
inner lives irradiated with sunshine an
blessing of those whose lives you have sc
with balm from the "amaranths of he
—*give*, and *do*, as you have opportun

Yours for the right, T. S.

NO. IX.—MARRIAGE.

MY DEAR GIRLS,—In touching up
theme of marriage I would do it
ently, as it is no trifling subject. N

re revolting than the manner in
some are given to speak of this con-
ted relation, accompanied with nods,
and sly inuendoes. You, my dear
are contemplating this relation as a
le or settled matter, and if I could in-
ny of you to look more earnestly and
ntly upon this life union, before you
he step which is to baptize you with
g and joy, or wring your heart with
h, I should indeed be happy. The
are apt to regard marriage as the ante-
er of heaven. That it is designed to
se the good and happiness of our race
ed true, but "it takes us by the hand
ads us into the great temple of Life,
duties stand ministering 'round the
altar, and the baptism of love is fol-
by the quick discipline of trial."

eral important facts connected with,
ties obligatory upon, married life should
roughly canvassed and pondered by all.
ldren should not marry. A young
cannot be considered in any sense
ed for this union under twenty-one;
-five is better. She is not physically
tally developed before this. Solemn
cares and responsibilities, await her,
t which she needs large physical de-
ent, mature judgment, good calcula-
omestic training, knowledge of men and
Girls of sixteen and eighteen cannot
hese. They cannot tell what they really
dislike—who and what will meet their
ities—until matured themselves.

that mysterious relation where soul
face to face with another soul; where
sities, tastes, aspirations, powers, and
eet and press against each other, what
or adaptation, intimate and vital union!
hat chafing, discord, suffering! Young
should not be so impressed with the
privilege, and *eclat* of marriage as to
nto the relation, without due thought,
nd acquaintance. You cannot over-
te the importance of a thorough know-
of the man whom you design to marry.
tness, fixedness of principle, an un-
and generous disposition, and good
ss abilities, should be regarded as in-
sable. If a young man is a good son and brother, he will make a kind husband, provided you do *your* part.

Do not be won by trifles. A handsome face, fine figure, and noble bearing may be desired, but they constitute a small part of what you really need. They may be but the gilt which hides some terrible deformity, and which, by-and-by, will cause you emotions of disgust, terrible grief, or constant unrest. It is not wise to aspire far above your present station in life, as this would give rise to solicitude lest you should fail to adapt yourself to your changed circumstances.

Marriage should not be entered upon without a knowledge of its physiological laws, else much domestic misery may be expected. Neither should it be sought for wordly gain or position. True esteem and affection, united to adaptation and congeniality of tastes, should form its basis. When this does not exist before marriage, it is hopeless to expect it afterwards. You must look out for breakers ahead, and feed the flame of love with pure oil. You will need fully as much tact, skill, and patience, to manage another heart as your own. If you cannot think alike, be resolved to yield rather than to differ. Avoid altercation and recrimination. Be forbearing and forgiving, if need be. I would also suggest that those graces and charms which won a lover's heart be still kept for the husband. Never consider it too much trouble to dress tastefully and in your best for your husband's eye. Give him freely of those graceful attentions and pleasant surprises which will make him happy, if you expect a continuance of lover-like attentions from him. Hide all the disagreeables, in person, toilet, and home, and keep the *best* for love.

My dear girls, in closing this series of letters, I am conscious of regretful feelings, to drop my pen from such delightful themes, and to have failed in using it better. If one of you shall feel the stirring of new and better emotions, stronger resolves, and higher aspirations, in consequence of what has been written, which shall lead to higher attainments in the school of life, it might well extract some of the bitter from the author's life. Again adieu.—Your friend, T. S. H.

CONSTRUCTION OF BOUQUETS.

MANY people decry the artificial arrangement of flowers; but how shall we otherwise use them to advantage? The moment we begin to tie them together we leave nature, and ought to do so only to study art. In their simplest arrangement, form and colour must be studied to produce the best effect, and whosoever best accomplishes this, will surely succeed in displaying his flowers to the best advantage.

Bouquet making is (or at least ought to be) *the art of arranging flowers.* Who has not seen bunches of beautiful flowers cut from the garden and tied up in the least artistic fashion with the most stupid result? And who that has attended fashionable weddings or parties has not occasionally seen a large bouquet or basket in which the *quantity* of good flowers was its only merit, where a mass of flowers were muddled together in a most incongruous fashion, equally removed from both nature and art? Nor is this fault that of the tyro in bouquet making only: many who practice it as an occupation have not learned the first principles of tasteful arrangement. Yet great allowance may be made for the bouquet makers, when we consider how much like labour their work becomes. Any one, trying always to execute this work with taste, would scarcely accomplish the amount of work required of him in any thriving establishment, a great part of which is of necessity done hurriedly; and as the variety of flowers is so great and constantly changing with the seasons, and their colours so varied, it is only by trying them in various combinations that the best results can be obtained.

Probably the simplest, easiest, and commonly the most desirable, method of using cut flowers is arranging them in vases. The more loosely and unconfined the better. Crowding is particularly to be avoided, and to accomplish this readily a good base of green foliage is required, to keep the flowers apart. This filling up is a very important part in all bouquet making, and the ne
of it is the greatest stumbling-block of th
initiated. Spiked and drooping flowers,
branches and sprays of delicate green, ar
dispensable to the grace and beauty
bouquet for a vase. To preserve the in
duality of flowers, which is of the gre
importance, the placing those of similar
and form together ought to be avoi
Thus heliotrope, stevia, eupatorium,
alyssum, when combined lose their dis
tive beauty; but, if placed in juxtapos
to larger flowers, and those of other fo
their beauty is heightened by contrast.
may be stated as a rule, that small flo
should never be massed together. I
flowers with green leaves or branches ma
used to advantage alone, but a judicious
trast of forms is most effective.

The circle must be taken as the lin
beauty in all bouquet making, apart
those loosely arranged. Hand bouquet
mit of the most formal arrangemen
flowers, and the tendency of all culti
tastes in this direction must be admitt
proof, that for this purpose something
than a mere bunch of flowers is requ
A well-bred lady never figures, even in a
of fashion, in evening dress, holding a
bunch of flowers or any odd shaped bou
Crude forms, pyramids, balls, &c., can

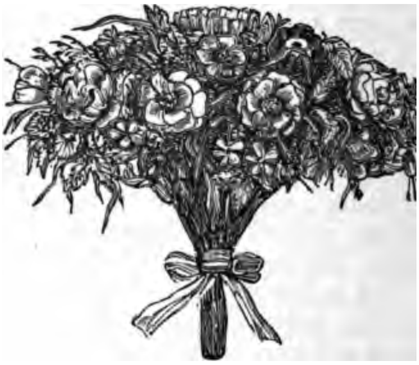


Fig. 1.—Hand Bouquet.

e the slightly rounding bouquet (fig.
is likely to continue for all time
form, like the parasol, which might
n its prototype.

form, the most important point in
making is the arrangement of colours.
ongruous mixing of these in a great
destroys the effect of the finest
while the more delicately the colour-
ended and the more strikingly con-
the more perfect and pleasing is the
Let any one who doubts this com-
ouquet of the best flowers, in which
lours are freely used, with one made
shading delicately from the centre to
d white, or *vice versa*, and with a few
its of bright scarlet or violet taste-
amidst the white.

rrangement of colours in simple geo-
forms is greatly preferable to a suc-
of distinct rings in a bouquet. The
attern is very pretty in a flower bed,
very questionable taste in bouquet
A bordering of white, blue, or pink,
generally used with good effect.
ne leaves of the geranium or camellia
er is preferable for its brightness and
y) alternating with fine sprays of
elicate flower scapes, or spikelets of
orm a fitting edging for a hand bou-
fine hand bouquet may be made
oth outline and relieved by a few
points of green or fine leaves. In
it a hand bouquet, half-dried moss is
e to anything else, as it can be used
dily to keep the flowers apart with-
uch increase of weight and stem: a
king of green, concave underneath,
he bouquet.

d bouquet may have its colour inlaid
aic with very good effect, and if the
be well toned and contrasted, such
t made with skill would compel any
saw it to admire, although many
bject to it as stiff and unnatural,
certainly is, but a handsome bou-
ertheless.

are some flowers whose colours re-
close communication with others;
the purple, ruddy purple, and most of the striped carnations, all roses with even a tinge of purple (and this includes most of the hardy roses, as well as others); in fact, there is scarcely any shade of purple which can be used to advantage in bouquet making. Excepting blue, like that of the violet, there is scarcely any shade of blue even, which can be advantageously used in a closely arranged bouquet; and the violet, beautiful though it be, is a very ineffective flower by gaslight; still more so is the favourite heliotrope. Many shades of yellow are harsh, yet some may be used with good effect in bouquets, particularly when toned with blue; for example, the racemes of Acacia pubescens, either in bud or blossom, as a bordering fringe, are exceedingly beautiful, and put to shame that over-fastidious taste which rejects all yellow flowers. Even established rules on colours fail to guide us always in the arrangement of flowers. Artists tell us that blue and green should never come together, yet the violet can have no more beautiful setting than its own green leaves, while dark blue flowers show to equal advantage in their darker green foliage. In Nature's own setting, all flowers are becoming; it is only by placing them at a disadvantage that they can ever appear otherwise; but so infinite are their shades and forms that their perfect arrangement in bouquets must ever be a work of taste and skill.

The following is a description of the manner in which the Parisian *fleuriste* proceeds to make up bouquets for sale; but it must be premised that so many flowers have short or unmanageable stems, or grow so close to buds which the grower cannot afford to cut, that artificial stems must be largely used. Even where stems are available, the bouquet maker in all good work prefers having another added to hold the flower in position, the strength of the stem being proportioned to the weight of the flower it bears. Thick stems must be avoided, else the bouquet handle becomes clumsy,—a very objectionable feature, as amateurs speedily discover, particularly when using flowers on their own stems. The stems commonly used are of broom or rushes, cut in lengths as desired, from four to eight inches. With this and hair wire, cut to three inches, the "stemmer" goes to work. By a rapid twist one end of the wire is fastened on the stem, and the flower is attached by a whirl of the stem between finger and thumb, as in fig. 2. Stemming is a large part of the labour of bouquet making, and rather distasteful to the amateur. One bouquet maker requires two stemmers, and a very prosy business it soon becomes to both, and vastly less interesting than the growing of flowers. Strong spool cotton or shoe thread is used for tying up the flowers. Camellia stems being entirely unavailable, a wire the thickness of a pin is passed through the calyx of the flower, the ends being twisted together. It is then stemmed on a light, dried willow—which admits of bending to the required position—with sufficient moss wound under the flower to prevent its outer petals being at all compressed, when set in the bouquet. Without some such provision it is impossible, either to attain the rounding outline of the bouquet, or to display the flowers in perfection.

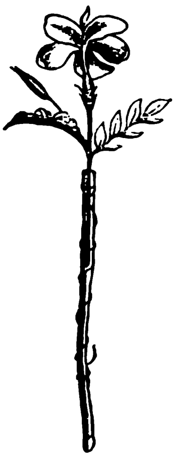


Fig. 2.

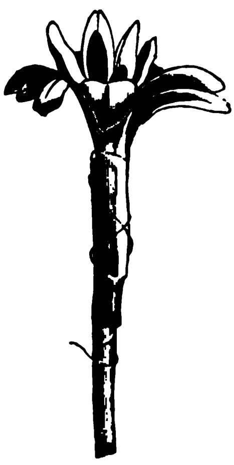


Fig. 3.

With flowers prepared, let us take a camellia for the centre of our bouquet, tie it securely to the bouquet stem, and wind moss around it, as already described, to keep the flower from outer pressure, the moss running to a point about two inches below the flower. Six tea-rosebuds are now set at regular intervals around and on a line with the outer petals of the camellia, and the spaces between these each filled with a small piece of white eupatorium—a very small geranium leaf or point of delicate green being set by each bud. A little moss is now wound lightly, close under the flowers, to prevent crowding, a pink carnation set behind each rose-bud, with tuberoses between; a speck of eupatorium being inserted under the edge of each tuberose, to fill out. Six white camellias of equal size and form, stemmed as described, are now set at regular intervals around, particular care being taken to form with the face of these flowers the correct outline of the bouquet, and their stems tightly bound, to prevent working out of place. Between each camellia, on the inner side, another tuberose is set, filled out with a speck of stevia under each side; more moss is added, and a bright speck of crimson bouvardia forms the sole dividing line between the centres of the camellias—which nearly touch each other. A tea-rosebud follows, with a violet set in sweet alyssum on one side, and a small geranium leaf in the same on the other; a white carnation is set behind each bud, with a stock of bouvardia or eupatorium on each side. A light border of stevia is now set around the whole, and with camellia leaves of equal form stemmed on willows, and projected nearly half their length, the bouquet is finished. The back is trimmed with fine leaves of any evergreen. The handle is cut to about three inches, and being a hand bouquet, is wrapped with tinfoil, wound over, and neatly tied above with a bow of white ribbon.

The outline of the bouquet must be carefully kept as the work proceeds, and sufficient moss from time to time packed lightly in front and immediately under the flowers. By this means the weight of the structure is borne by the stems, the flowers being only allowed to touch each other. Moss not only serves well to keep the flowers apart, but acts as a sponge when the bouquet is set in water, giving moisture to flowers with the st stems; and bouquets thus made are durable than the casual observer—who regretfully on the beheaded flowers— to imagine. When, in addition to the , a piece of wet cotton is stemmed to flower (as it should be done), the al stem is not unkindly superseded. The r must work with a tight thread, to pre- the flowers from getting out of place, keep a clean surface on the handle.

nother method of bouquet making is to ball of moss rather loosely on the uet stick, and insert the flowers (which temmed to suit the work), drawing them n to the required position, and tying as vork proceeds.

se bouquets are made similarly, with more n "backing" between and around the ers, for loose arrangement, and to support greater weight.

ower baskets of the ordinary kind are lined tinfoil, or, if not likely to shew after fill- any tough paper will serve the purpose. are then filled with sawdust, rounding e, damped and covered with wet moss; rder of arbor-vitæ, or other foliage is set around, to support the overhanging flowers. The flowers, stemmed on pieces of stick (fig. 3), or twigs, are now inserted according to the taste of the worker, with moss packed between them as the work proceeds. Baskets thus filled and sprinkled with water keep well; but the more common method is to insert lycopodium over the whole surface, and arrange the flowers therein without any moss packing.

Wreaths are commonly made on a stout wire, which has a straw of matting wound to it, to enable the thread to hold; a backing of green is laid for the flowers as the work proceeds. Both green and flowers must be wound on with points projecting to each side, the stems crossing like the letter X. If laid straight along, the flowers are huddled together, and the arrangement seems thick backed and clumsy. When the desired length is attained the ends are firmly tied, and flowers and green together are pressed round on the wire, and by this means turned to face as required; a bow of white silk bonnet string finishes the wreath.—*J. H. Park.*

USES OF THE IVY.

Mr Robinson's well-known work on the "Parks and Promenades of Paris," he ants largely on the value of the ivy and numerous uses to which it is put by ch gardeners. Mr Shirley Hibberd, the or of the *Gardener's Magazine*, also holds ivy in great estimation (and who does) and as it is a plant too much neglected illa Gardeners, we think it may be doing readers a service by giving them the fol- ng extract from a paper by Mr Hibberd, h recently appeared in the pages of the e-named periodical.

r Hibberd says the ivy is one of the best ll plants to cover shady walls, the stems ad trees, to roam over ruins, and to carpet ground under trees where grass will not grow. The Irish ivy is the most valuable of all for general purposes; but those who plant a number of varieties on their walls, rockeries, &c., will be abundantly repaid in the great diversities of the forms and colours of the leaves, and the changes which they undergo with the revolutions of the seasons. Some of the variegated kinds acquire rich tints of red in winter, and the smallest leaved variety of all (to be described hereafter) changes from a dark green to a purplish brown in winter.

They are all well adapted to form marginal and boundary lines. A great chaplet of Irish ivy, enclosing a flower bed or clump of shrubs, gives a noble air to a spacious forecourt. The value of the ivy as an "edging" plant is made manifest by the present appearance of Islington Green, a once very desolate spot on the north side of London, now a leafy garden, the great compartments edged with Irish ivy, and the open spaces covered with good turf. The small silver-leaved varieties are well adapted to form edgings in the flower garden, as they are not only extremely beautiful during summer and autumn, but *all through the winter;* in fact, there is nothing of the kind, as to habit and colour, to equal them for winter embellishment.

Ivies may be grown in pots, so as to be of immense value for conservatory decoration in winter. Mr Salter, of Hammersmith, has always had in his beautiful winter exhibitions a number of fine specimens of variegated ivies, extremely beautiful both in contour and colouring, the result simply of patience; for there is but little skill required in the production of specimens.

For out-door embellishment of the flower garden the ivies are invaluable. It is not necessary to carry out the plunging system *in extenso* to derive from these handsome plants all the advantages they offer for tiding over comfortably the dreary winter season; they must be grown in pots for the purpose undoubtedly, but they may be plunged in common soil with a brick or tile under each pot, to ensure perfect drainage and prevent the entrance of worms; and thus they are well adapted to furnish beds that are occupied during the summer with geraniums, &c.

When grown in pots for out-door embellishment in winter, and, indeed, for whatever purpose grown, the climbing sorts should be trained as pyramids. It is not right to dictate on matters of taste, so we will only remark that, during fifteen years' cultivation of ivies in pots, we could never devise any form of plant satisfactorily except the pyramid, or we should say, *sugar-loaf;* for just such a cone as the sugar-loaf is cast in is the very best form in which to train a pot ivy. We have trained them in the form of cylinders, that is, as wide at top as at bottom, and they were abominably ugly. We have spread them out on low, flat, convex trellises, in the hope of making "tufts" of rich dark green herbage for the front lines; but they never answered, and we were glad the next season to untie them, and train them up in the conical form. You will say, perhaps, that a group of ivies in a winter bed must have a very stiff, monotonous appearance. Not so; the arborescent kinds form freely-branched bushes without any training at all, and thus afford variety of form and an air of *freedom* to a group. Then the variegated kinds light up the group splendidly. Lastly, you are not restricted to ivies for winter beds, however many you grow of them. The wise man will mix them with hollies, thujas, yews, &c. We have several times made up beds of ivies only, and they were never so effective as beds in which other kinds of evergreen shrubs were employed. You will judge, therefore, that those who are enthusiastic about them need not become ivy-mad.

THE PARLOUR GARDENER.

CHAPTER III.

THE ETAGERE GARDEN.

on the Etagere—Succulent Plants—Peculiari-
their Organization—Dwarf Succulent Plants
ents that they draw from the Air—Cactus—
ias (Prickly Pear)—Melocacti (Melon Thistle)
inocacti—Stapelias—Sedums—Mesembryan-
ms—Ice Plants—Crassulas—Culture of Dwarf
ent Plants—Necessity of depriving them of
during their Sleep.

out a few years since the fashion of
gères has become general. People
y covering them with all sorts of
s and specimens of natural history—
which exists still. Then they fabri-
t of wire, gilt, silvered or bronzed,
little étagerès in open work, which
little room, could be hung up any-
nd hold a whole collection of orna-
lants.

The Etagere Garden.

DWARF SUCCULENT PLANTS.

eries of plants belongs, for the most
an order of vegetation having a very
organization, and endowed with ex-
ry vital energy. They are commonly
cculent plants, and are remarkable for
kness of their fleshy and persistent
Among a great many of these plants
and the leaves are one and the same
he leaves, when leaves exist, fulfil
ions of the stalk ; and reciprocally, when the leaves are wanting, their vegetable duties are fulfilled by the stalk.

You have no idea, my dear madam, how much skill and patience the horticulturists by profession have displayed in dwarfing these pretty plants; some of which, when left to follow their own notions, in their native country, attain to colossal dimensions.

Quantity of earth requisite.—A fact which, above all others, must strike us in examining a collection of dwarf succulent plants, is the extremely small quantity of earth allowed to them. Of those which come most properly under this head, some will live in pots of the size of an ordinary tumbler; whilst others are cooped up in still narrower lodgings, their domicile not exceeding the dimensions of a small wine glass. It is because, in general, the succulent plants, dwarfed or not, scarcely live by their roots. Then, you will say, on what do they live? They sustain themselves on an aliment with which neither you nor I would content ourselves; they live on the air of the heavens—literally, and without rhetorical figure. By the way, permit me to remark to you, that all plants, without exception, live more or less on the air, even those which derive the greater part of their nourishment from the earth.

Suppose some immense tree felled, split, and cut up into small pieces, and converted into charcoal, it would make an enormous mass of it. Do you imagine that the tree could have drawn this mass of carbon from the soil where it grew, which does not contain a particle of carbon in its composition? No, it drew this material from the atmosphere by decomposing the air with its leaves. That is what our pretty little dwarf succulent plants do; and without this faculty, which they possess in a very high degree, they would not live.

Cactus—Opuntias.—Consider first those which belong to the numerous and strange family of the cactuses; all of them natives of the warmest parts of America. See the opuntias, whose leaf-stems or stem-leaves, whichever you please to call them, have the form of so many battledores placed alongside of each other. These little plants represent to you in miniature those on which, in Mexico and in the island of Madeira, lives the insect called *cochineal*, that furnishes to dyers and painters their finest red, under the name of *carmine;* from which also, by-the by, is made that *rouge* which occasionally serves in giving colour to the complexion of ladies towards whom Mother Nature was stingy when she painted their cheeks. I do not mean, however, my dear young ladies, to intimate that this was, by any means, the case with any of you.

Melocacti and Echinocacti.—To the same family belong also the Melocacti and Echinocacti. Their rounded forms composed of prominent ridges, their pretty crown of little satiny flowers, of a fine golden yellow, resemble those of no other family. In the mountains of the interior of Brazil, and in those of the centre of the island of Jamaica, these same plants—plants of the same species—that you here see reduced to such exceedingly small proportions, grow upon the slopes of the most arid rocks, and become very large. Knowing this, you will understand that their bunches of thorns, inoffensive in the dwarfed plants because of their minute size, constitute defensive weapons whereby they are preserved from the teeth of animals. Nevertheless, these arms prove useless to them against the wily attacks of the numerous herds of goats kept by the English colonists of Jamaica. The goats, animals essentially climbers by nature, climb up the most abrupt declivities of the rocks covered with melocacti and echinocacti. There, using their horns for the purpose, they root up these plants, and roll them down into the valley, where, as a preparation for eating them, they play with them as a child would play with a toy balloon, until, by dint of rolling and tossing them about on the pebbles, the thorns have been all shaken out. Then the goats are able to feast upon them without damage to their mouths, just as though the thorns of the colossal cactuses were as little to be dreaded as are these downy representatives of those hard and tough spikes, produced by their sisters in miniature.

Stapelias.—There are other plants, of a different family, but the forms of which recall those of the cactuses: these are the Stapelias. You will not fail to remark their strange flowers — thick, fleshy, violaceous, set with rough hairs, and having the form of a star. Do not approach too near this plant while it is in flower, for its odour is not agreeable. This peculiarity, however, should not induce you to exclude it from your étagère, where it will be very well placed, because of the singularity of its form. As to its smell—which is not strong enough to incommode you—I should not have mentioned it, but for the circumstance of its having caused this flower to be mistaken for a very different thing by the flies called flesh-flies, which mistake has given rise to quite a curious observation in natural history.

Have flies noses? you will say, ladies.

I must acknowledge that I do not know whether they have or have not noses, although entomology, together with botany, are my favourite studies. This much, however, I do know—that they have the sense of smell. That this is certain you can ascertain for yourselves, by having a stapelia in bloom upon your étagère. The flower of the stapelia smells like meat that has been kept too long; and flesh-flies, who lay their eggs on spoiled meat, are attracted to this flower by its smell. These eggs give birth to worms destined to become flies in their turn. If you shut flesh-flies up in a chamber where there is a stapelia flower, they will come and lay eggs on this flower, taking it for flesh—an error which they cannot be led into by the sense of sight, for the stapelia flower does not resemble in any respect a piece of meat. Consequently this mistake can only arise from their being deceived by the smell, from which fact naturalists draw the conclusion, not that they have noses, but that they have the sense of smell.

Sedums and Mesembryanthemums.—There is another family of plants, no less various, no less rich in pretty and copiously flowering than the cactus family itself. These Sedums, among which I have already u acquainted with the pretty, yellow, ered sedum (stone-crop) which blooms earth and without water, suspended ead to the wall of a room.

ier species, that of the Mesembryan- s—with numerous flowers of all the f red, from the colour of fire to the ose—belongs also to the series of t plants. The prettiest varieties have ndered dwarf by the horticulture of

If their name—a little long and a rned—seems disagreeable to you to ce, call them plainly *ice-plants*. This mmon name of the variety that is the ensively cultivated, and the leaves of with the stalk also, are powdered if covered with frost.

are also the Crassulas, with their legantly imbricated, and their little of flowers of the deepest red. You l some, also, of a pale rose-colour. as perfect in form, and as brilliant r, as the same plants are in their limensions, of half a yard or more in

s over some of the best. But when made your choice among the pret- rf varieties of cactuses—of the kinds tia, melocactus, echinocactus—and u have added to these stapelias, ice-plants, and crassulas, confining to the finest varieties—you will have a sufficiency to decorate your étagère, be a large one, but also enough to gant basket, which will produce the t in the middle of your stand. And ing more than half of the year, you tantly have some of your dwarf succants covered with pretty flowers.

e.—It only remains to give you some ut the way of managing them. For ose it is necessary to say a few words ir temperament. Cactuses, in their untry, bear excessive heat and dry- ix or seven months without interrup- owed by deluges of rain. The most torm-rains in our latitudes afford but aint idea of those tropical deluges. During the dry season the vegetative life of the cactuses is almost quite suspended. Their sleep is then much more profound than that of the plants with us which lose their leaves in winter. Now, from the knowledge of these facts, we perceive what sort of management is most suitable for them. All those which give no sign of active vegetation—on which neither young shoots nor flower-buds make their appearance—ought to be watered only once a week. You may abstain altogether from watering them; there will be neither more nor less budding for it when the proper time comes. Continue the same treatment if, at the return of warm weather, the cactuses shew no signs of flowering; leave them dry a month or two, they will not die for it—no danger of this. When they begin spontaneously to vegetate, begin to water them with water of the temperature of the room, at first moderately, afterwards a little more freely, but never to excess. The floods of rain that they get in their native country do not hurt them there, because the tropical climate renders evaporation rapid. It would not be the same in your house. The quantity should be a tablespoonful of water for the pots of the size of a tumbler, and a teaspoonful for those the size of a wine-glass.

Necessity of depriving them of water during their sleep.—That you may perfectly understand the necessity of not watering your cactuses during the sleep of their vegetation, I will relate to you what happened to a botanist, who, being extremely fond of cactuses, had a very fine collection of them. A friend sent him a box of cactuses from the province of Minas Geraes, in Brazil, which he hastened to put in pots in his conservatory, and at the same time put by in a drawer a double set of specimens, which he proposed to make presents of. Forced to set out on a long journey, he forgot the cactuses in his drawer; and on his return home, after an absence of several months, he found them there, faded, withered, in so deplorable a state that he thought them lost. Nevertheless he planted them, and began to water them by degrees. All recovered and flowered abundantly, while those which had been planted and taken care of ever since their arrival, only flowered in part; many did not flower at all. His gardener had been afraid of letting them suffer from thirst, and had given them too much to drink.

Keep in mind, then, ladies, that in order that your cactuses may bloom, it is necessary that the periodic sleep of their vegetation should be complete; and that it cannot be so if they be watered at the wrong time. As to temperature, they are of a temperament that accommodates itself very well with what suits yourself. When they bloom during the warm weather, put the étagère before the open window some hours every day: your cactuses will be the better for it; their bloom will be more brilliant and of longer duration.

The stapelias must be treated like the cactuses—no difference. The other succulent plants require a little more water in winter; their sleep being never so absolute as that of the cactuses and stapelias. Nevertheless, if you would have them to flower well when they wake, let them sleep. Do not water them during their sleep, except when they appear evidently to be suffering from thirst, and then give them only just so much as is necessary to relieve their suffering.

THE

UNTRY GENTLEMAN'S MAGAZINE

AUGUST 1870

MR CARLYLE AND THE EMIGRATION QUESTION.

O important has this question become,
that even "the Seer of Chelsea," who
ally is very reticent of speech, seems to
e deemed it imperative that he should
e utterance upon it. Although he has
en inculcated that, while speech is silvern,
nce is golden, in regard to this emigra-
n question at the present time he appears
regard speech as more valuable than the
lding of peace. Mr Carlyle's adum-
ition upon this matter has been called
th by a pamphlet on "Australian Inde-
ndence: Remarks in favour of the Six
stralasian Colonies," by Mr C. F. Hurst-
use. Mr Carlyle being a man who may
said to have influenced and modified in a
eater degree than any other writer the ten-
ncy of modern thought, anything coming
m him, and especially upon such an im-
rtant social problem as that of emigration,
nnot fail to be read with interest and re-
ect. We therefore give it in full. It will
noticed that Mr Carlyle has lost none of his
d vigorous terms of vituperation for those
th whom he does not agree. This country
this England of ours, the pride of the
ean, first gem of the sea—is, we are told in
words of the prophet who dwelleth by the
er at Chelsea, a very "choking, madden-
Black Hole of Calcutta," where Eng-
d's children are "perishing, soul and body,"
le fertile continents of English land in all
ts of the world are calling upon them to
"come and till us, come and reap us." But the circumlocution of the Government, according to Mr Carlyle, steps in and says, Oh, it is impossible to organize an efficient system of emigration; but that word impossible, says Mr Carlyle, should be expunged from the English vocabulary, and he persuades himself that the "voice and instinctive sense of the English will be got upon it while time yet is, and the Government be taught that it is not permissible to cut away the English Colonies and fling into the sea, as useless lumber and encumbrance, the most precious possession any nation ever had."

But we must now allow Mr Carlyle to speak for himself:—

> Dear Sir,—I have read your pamphlet, which you were so good as to send me. I participate, and have long done, your patriotic sorrow, astonishment, and indignation at the course our English Government has got into in regard to its Colonies, and to the endless resources lying open to us there, especially now when the crisis here at home is growing stringent, and no other feasible escape from domestic issues, which are horrible to contemplate, seems to remain for us. England's children perishing, soul and body, here in their choking maddening "Black Hole of Calcutta," with fertile continents of English land, in all regions of the world, calling to them, "Come and till us, come and reap us;" and the Government answering steadily, "Impossible;"—seldom before in the history of the world was there seen such a spectacle. For surely, in the nature of things, no axiom of Euclid is more undeniable than what ought in such a case, to be done, Nature herself points out what now is to be got done! And all English souls have a right to answer their Government

in this case. "Impossible, say you? It is *impossible* for us to believe it to be impossible! We advise you to find out what it is in *you* and your ways that hinders it from being possible; and, with great diligence, indeed (for the case is getting critical), to try and alter that!"

It is, withal, plain enough to me what difficulties a Government like ours will have in organizing such an enterprise; too plain to me what the deep-seated (and, for a long time, as yet incurable) *origin* of such difficulties and "impossibilities" among us, is—but on that we need not dwell at present—perhaps, our grandsons will see it more clearly, and begin and seek a remedy. Too true it is that with us and our admired "Government by National Palaver," all administration, not of colonies alone, becomes more and more, and it is fatefully driven to become, what Dickens calls it, a "Circumlocution Office, or a teaching us how *not* to do it!" which will one day seem a strange institution in this world.

Nevertheless, in regard to this most pressing interest (of colonies, of emigration, over population, of pauperism, millionairism, unpunished scoundrelism, &c., &c.), I still persuade myself that the voice and instinctive sense of the English people will be got awakened on it, while time yet is; and the Government be taught that it is not permissible to cut away the English colonies, and fling into the sea, as useless lumber and *incumbrance* (which truly it is in a "Circumlocution Office!") the most precious possession any nation ever had; and, above all things, that the Government will before long find itself compelled to attempt, in concert with its colonies, some veritable *National System of Emigration*, and, with whatever difficulty, to develope that into a regulated, governed, continuous, and vital function of this overcrowded and bewildered country; which salutary enterprise, one can foresee, would be the beginning of all manner of rational, just, and solid relations between England and her Colonies, and, if faithfully persisted in, and pulled and pushed forward on both sides of the sea, would more and more teach England and her Colonies whatsoever is wrong, and how to remedy it, in their relations to one another.

With heartiest wishes to this effect, and thanks for your efforts therein, T. CARLYLE.

This letter, though strong after Mr Carlyle's peculiar manner, has doubtless in it a great deal of truth with regard to circumlocution in various of the Government departmen with reference to the folly that would played in the parent country abandon Colonial offspring. But we do not s there is any such desertion, or castin contemplated in the Colonial office. Al the inadvertency of some recent legi about the Colonies may have tended in measure to estrange the colonists, tl which bind us together are too close severed. We may agree with Mr C that a national system of emigratio organized and managed, would be to the advantage of this country, to the benefit also of any thinly p colony to which any of our industri industrious population might go with prospects of obtaining profitable e ment. But, then, what is the proport the surplus of our working bees—n drones, which would be as useless acr seas as they are at home, or even m —who wish to emigrate, and what chances on the other side of the water? is what the people interested in emig in conjunction with Government, are ing to find out, and very properly so, a will then have a satisfactory basis upon to found regulations or legislation. It also be ascertained before a wholesale triation of our people is recommended urged, at the public expense, how fa labour might be made available in the mation, drainage, and general improven waste or other lands, or on useful public here.

We believe that many persons co employed in this way, both to their ow the advantage of the general comm and it would be a pity to transport th and sinew of our country to other land such things remain to be done at home

TENANT-RIGHT.

S is the real panacea for all the ills
iat farming life is heir to. At least
ld appear, from a paper read before
Chamber of Agriculture, by Mr J.
ner, which we print at page 85 of
nt number.
mmencing his lecture upon land-
Mr Gardiner does not disguise his
f yearly tenancy in any euphuistic
He states, plainly and forcibly, that
highly objectionable one." And while
with him that it is, in principle—ob-
le, in so far that it places in the
a grasping landlord a power which
o readily use to the disadvantage of
orking tenant; and almost as objec-
insomuch that an easy-going land-
etimes, by not wishing to appear too
dispossessing an indolent tenant,
lations have been on the estate for a
able time, often deprives the com-
f a large quantity of food which the
ld be made, under proper manage-
yield—it is nevertheless true, that
tive and well-to-do farmers prefer the
nancy to a lease. We cannot under-
e preferences of men of this character;
have them, and object strongly to
this liking, convinced against their
he offer of a long lease to such from
ndlord, would appear like an eject-
m the fields they had so long tilled.
diner, however, looks upon yearly
s with eyes different from those we
t described, and, in our own opinion,
es. He does not deny that there
y good landlords who, even under
at will, treat those occupying their
ghteously; but the times and the
of life and death are not in the hands
quire, but in the disposal of Provi-
and in a mysterious way the good
might be suddenly called away, and
eded by another king who knew not
cultural Joseph. A hard task-master he might prove himself to be, wishing the farmer to make bricks without straw, or, less figuratively, raising the rent to such a pitch that the latter could not grow straw enough to pay it. Feeling aggrieved, he casts about for another farm; probably does not find one, and is under the necessity of remaining, though at the expense of every farthing of profit he has previously made, thus being unable to provide for wife and children in the event of death. That inevitable time does come, and as on some estates no female tenant is allowed to farm, the wife and family must leave, while as yet a portion of the husband and father's capital lies buried in the soil; and the knowledge of that fact probably induces the incoming tenant to pay an increased rent. "It is," exclaims Mr Gardiner, "a burning shame that this should be." And no doubt it is. But it does not often occur. It is the very darkest side of the picture,—the cloud without the lining of silver. Still, it is a pity such things should be at all, and yearly tenancy does make them possible. Therefore we ourselves prefer leases. The holder of a written agreement terminable by notice, is, in the opinion of Mr Gardiner, placed under more favourable circumstances than the yearly tenant, because he knows that two or three years gives him a little time to look about. Now, this account of a written agreement does not appear to us to be very explicit. Why should the holder of this have only two or three years to look about? A written agreement might as well, we should fancy, be for ten years or for twenty. Wherein does a lease differ from a written agreement? However, as Mr Gardiner's remarks under this heading are brief, we pass on to his views of leases. The leaseholder, he says, is safer than the other classes mentioned above. But long leases must be the order of the day. Twenty-one years appears to be Mr Gardiner's minimum term of duration, from which we take it that he has

gained his experience of farming on the north side of the Tweed. No bad school.

"Seven years," says Mr Gardiner, "will just enable him to put his farm in good trim for a rise of rent and a renewal; fourteen years will allow him, clock fashion, to run his farm up in condition, and then run it down again, but putting just as much capital in the soil the first seven years as he can extract in the last seven—thus leaving his farm as he found it. Twenty-one years is more tangible; it gives a man a firm foot; he looks upon his farm as his home; he becomes attached to it; the improvements are his own creation; his parish shares his regard; and with himself and his landlord there exists a more kindly feeling; he is looked upon by him as part of his estate, like his ornamental trees, not to be parted with."

This is a fine enough picture of a tenant, but still not so glowing as Mr Gardiner would have it. He would have the leases renewable by lives and fines, and then we would have "something like fixity of tenure almost to a certainty." But even this is not enough. Vexatious and restrictive clauses in the leases—almost all drawn up in such a way as to favour the landlord over the tenant, and often to keep the tenant for taking the most he can out of the land—the varieties that occur in different counties in systems of rotations, customs, &c., all operate against the interests of farmers even with long leases.

What, then, are we to have in substitution? A simply defined law of tenant-right, says Mr Gardiner, which shall, on appeal, override all other agreements, customs, and systems, not to supersede them, but to secure to the tenant compensation. This is the way it is to be done:—"1st, Permanent improvements; 2d, unexhausted improvements; and 3d, unexhausted manurings. Under the first head, such as improvement of premises, bringing into cultivation waste lands, moors, and bogs, stubbing up old fences and woods; the second head, such as draining, n chalking, liming, and steam sub-soilin under the third head, such as manurin sumption of corn and cake, green-crop during the last year. This law would people to let and hire upon what pr they pleased, as now, except that the could, by law, get compensation for wl hitherto been refused, except in some markable instances, and by custom in part of Lincolnshire. I go further: I by lease of not less than twenty-one with power to renew at the end of years, establish free farming upon the right principle, with an inventory tal the farm premises, the state and condi each field and meadow at the time of if the farm is left in an improved con compensation should be given, and teriorated, damages should be awarde Lord Leigh's principle of umpirages."

In theory this is no doubt admirable, we to get it to work smoothly in pra There would be a great deal of differ opinion naturally about the value of hausted manures, and of consumption c and corn, and roots. Then the co son of the value of the farm fiftee before, with its value at the presen would be no easy matter, as the v of the former period might have had valuation very different from those a by his successor in the office. We sho to see a fair system of tenant-right esta just as we desire to see an efficient, all parties in the State, a satisfactory of National Education, but we are no ful that we shall see it just yet. We w so sanguine as Mr Forster was about t and speedy passage of his Education has found the difficulty surrounding th tion, and so will Mr Gardiner find ou hedging round that of a general tenan

TENANT RIGHT—NOT LANDLORD'S WRONG.

Read before the Essex Chamber of Agriculture by Mr J. S. GARDINER.

ducing this subject to the Chamber I
divide it into two parts—first, by shew-
cessity; second, by pointing out its
s, with the hope of proving, before I
that tenant-right will not be landlord's
do not hesitate to say that it stands
none as one of the most important
of the day, as connected with country
one in which not only the interests of
ord and tenant are involved, but one
indirectly affects the well-being of the
al labourer, by lessening the demand
mployment, and consequently a lower

ss I am not able to do justice to this
but will try, nevertheless, to give you,
own point of view, such opinions as I
ned during twenty-six years of active
nt as a farmer.
ve in this country different tenures of
he highly-objectionable one of yearly
r tenant-at-will; 2. the holder by a
greement terminable by some short
the lease-holder for a term of seven,
or twenty-one years; and 4. the more
lease-holder by lives, and renewable
c.

RLY TENANCY OBJECTIONABLE.

ask, is it reasonable to expect a man
capital in the soil as a yearly tenant,
good the landlord may be? and we
re are many good landlords; yet his
le to be called away at any time, and
e succeeded by others of very different
; the screw for more rent may be ap-
a notice to quit. He feels uncom-
t this, and looks around for another
the competition is so great that he fails;
cessity compels him to submit, although
by sad experience that every extra
profit he makes upon his insecure ten-
go in rent, leaving him unable to make
for wife or child. There are estates
no female tenant is allowed; and thus
th of the husband the wife and her chil-
quit, although some large portion of the
capital remains buried in the soil. It
ng shame that such things should be.

WRITTEN AGREEMENTS NOT GOOD ENOUGH.

The holder by a written agreement, terminable by notice, is somewhat better off. He knows that two or three years gives him a little time to look about; yet it is but a poor security for an outlay of capital on anything like permanent improvements.

LEASES BETTER, BUT DIFFICULTY IN ACTING UP TO THEM.

The leaseholder fares better: he is safe for his term. Seven years will just enable him to put his farm in good trim for a rise of rent and a renewal; fourteen years will allow him, clock fashion, to run his farm up in condition, and then run it down again, but putting just as much capital in the soil the first seven years as he can extract in the last seven—thus leaving his farm as he found it. Twenty-one years is more tangible; it gives a man a firm foot; he looks upon his farm as his home; he becomes attached to it; the improvements are his own creation; his parish shares his regard; and with himself and his landlord there exists a more kindly feeling; he is looked upon by him as part of his estate, like his ornamental trees, not to be parted with; so he does tolerably well. But who is there amongst the tenant-farmers who does not envy the position of the leaseholder, renewable by lives and fines? Here we have something like fixity of tenure, almost to a certainty; hence, it should be a piece of example for good in everything connected with farming, especially the well-being of the labourer. But even here we have some drawbacks — there is something he can't do. Now, most of you know what wonderful structures leases are (farm agreements are not much better), of almost endless length, overflowing with the antiquated and complicated wisdom of musty old lawyers, handed down by precedent from feudal times, too often impossible to understand or explain, except by Paddy's rule of reading things backwards, making liberal concessions to be afterwards qualified, except as before excepted, withholding what had been conceded, hampered by restrictions, fines, and penalties (according to our present notions for doing right rather than wrong), yet in terms plain enough securing to the landlord rent in money, rent in fines, and rent in sundry little requirements of a vexatious character. A gentleman, a short time ago, who had reserved a claim of this sort, wanted his tenant to stop drilling and harrowing, to fetch coals; the tenant refused without longer notice; of course the landlord was exceedingly angry. I believe nineteen-twentieths of the leases cannot be acted up to, however willing the tenant may be to do so. I saw a lease not long ago, in which it would be easier for the tenant to imitate Blondin with his barrow on a tight rope, than to steer clear of breaches of covenants, fines, and penalties. Pollard trees and fences to be topped and cut once in eight years, neither to be grubbed up without consent in writing, reserving the game and the right of fishing, although not somuch as a pond existed on the farm, only a small spring or ditch in which a stray minnow or two could be found, to take one of which would be a breach of covenant. The farm is let, and we can well pity the sorrows of the poor man. One thing was not reserved, viz., the right of hawking, for two reasons, I presume, hawks are game destroyers, and herons are not worth the eating. I knew a farm farmed on the five-course shift, on which a tenant was fined £10 per acre for having ten acres more clover ley than peas and beans in the shift, as preparation for wheat; and another farm farmed on the four-course shift, where £20 per acre is the fine imposed should there happen to be a few acres of barley shift sown with wheat. Surely these things ought not to be. It is to be observed, that if the average field on a farm be ten acres, then the tenant pays rent, tithe, rates, taxes, and labour for ten acres in the hundred which produce nothing but weeds and rubbish. Again, an average sized tree in the hedgerow will spoil 10s. worth of corn for every shilling's worth of timber produced for the landlord from that stage of its existence; hence the major part of the fences and trees should be grubbed up, especially the old pollards.

VARIETY OF CUSTOMS, &c.

We have also a great variety of systems, shifts, and customs; we have the Essex and Suffolk, the Norfolk and Lincolnshire, the Cambridgeshire, the Hertfordshire, and the Scotch systems; we have the four-course, the five-course, the six-course, the seven-course, the eight-course, and the everlasting shifts. The customs, too, are of endless variety, according to agreement or locality, one overrides all others, viz., where the entry can be proved, to leave as you enter, which often leads to expensive valuations and litigation, even to half the amount involved; then we have the Lady Day, the new Michaelmas Day, and the old Michaelmas Day entries, in some districts with valuations, in some without; in some, marling, chalking, liming, draining, and manuring are paid for, in others nothing; in some, the tenant makes his own fallows; no valuation; the outgoing privilege is to sell all hay and straw from the farm, in other places consuming value is given, in other market value, and so on.

Is it to be wondered at, when we reflect upon the heterogeneous modes, systems, and customs of agriculture, that many parts of the country should be imperfectly farmed? that there should be a lack of capital employed? that the demand for labour should be reduced to the make-shift principle, too often poorly paid for? And, again, if we look across the country, and see the waste lands, the small enclosures, the useless fences, the expensive hedgerow timber, the lands imperfectly drained, and the labourer standing idle during winter, like a parasite living upon the ratepayer — then I say, for one, the time has arrived when we should manfully put our shoulders to the wheel—when we should try to find out some plan by which new energies and new forces may be applied to the better cultivation of the soil, and the bettering of the condition of those who have a right, and ought, to earn their bread by the sweat of their brow.

TENANT-RIGHT THE BEST THING.

The great question now is, how shall we remedy these evils? I say, with others, by a simply-defined law of tenant-right that shall over-ride by way of appeal all other agreements, customs, and systems, not to supersede them, but securing to the tenant compensation—1st, permanent improvements; 2d, unexhausted improvements; and 3d, unexhausted manurings. Under the first head, such as improvement of premises, bringing into cultivation waste lands, moors and bogs, stubbing up old fences and woods; under the second head, such as draining, marling, chalking, liming, and steam sub-soiling; and under the third head, such as manurings, consumption of corn and cake, green-crop feeding during the last year. This law would allow people to let and hire upon what principle they pleased, as now, except that the tenant could by law get compensation for what has hitherto been refused, except in some few remarkable instances, and, by custom, in some part of Lincolnshire.

I see Lord Leigh has caused a circular to be sent to the tenant farmers on his estate, to in-

hem that should they, from any cause
er, quit the farms they now hold, every
usted improvement made at their expense
farm will be paid to them, the value to be
ined by two persons, one chosen by the
, and the other by the landlord ; they ap-
g an umpire, whose decision shall be final.
s a noble example! Richard Cobden, the
farmer's son, than whom, perhaps, no
statesman knew better what was required
tenant farmer, said, in one of his cele-
speeches, that the only agreement neces-
as a valuation in and a valuation out, with
pensation clause for unexhausted improve-
, and a clause for damage for deterioration.
further: I would, by lease of not less than
-one years, with power to renew at the
fifteen years, establish free farming upon
nant-right principle, with an invento
of the farm premises, the state and con-
of each field and meadow, at the time of
if the farm is left in an improved condi-
ompensation should be given, and if de-
ted, damages should be awarded upon
Leigh's principle of umpirages. I would
tenant farm by the strength of his ability,
have fair play, unshackle him ; a man
ital will farm cautiously and well; no land-
eed be afraid of exhaustion ; if he suc-
in growing crops upon the same land
ear, he must farm the better to do it; the
ho can grow two crops where another
t one, or causes two blades of grass to
nstead of one, is no exhauster ; depend
t he can only do it in one way, and that is
ining, marling, chalking, liming, and
ploughing, according to the requirements
soil, by filling his land full of richness, and
ploying more labour to keep it clean ; such
as this would enable him to pay a higher
d gather for himself larger profits.

doubt one of the results of this law of
-right would be to induce high farming,
keep the farm in a high state of cultiva-
the end of the lease for the sake of the
on ; and were I going to hire a farm I
rather pay the outgoing-tenant a high
on for permanent improvements and un-
ted manurings and feedings, than have to
farm in a wretched condition to work up
hings myself.

Moreover, be it noticed, that these valuations would ensure to the landlord men of capital ; the tenant-right lease and the high condition would ensure more rent, with the satisfaction of seeing his estates improved in value, without any considerable outlay on his part, and be free from many petty troublous complaints that now exist.

I will not here discuss as to how far it is desirable to go back for compensation for permanent and unexhausted improvements and manurings ; that can be settled satisfactorily another way. I have my opinion ; others have theirs. We should differ to agree, and draw a line that should be as fair as it is possible to make between opposing opinions. I know that it is possible to farm well upon the old customs, shifts, and systems. Good farmers will adapt their procedure to any system of restrictions; at the same time, be it observed, they can do better without. What we want to do is to legislate for the well-being of the whole body, and sweep away the old vexatious and exploded customs that too often keep one-fourth of the land bare fallow, as in the old four-course shift. Land, in my opinion, like men, should never lie idle, by adopting the everlasting shift ; it would always be growing something; the cultivator would vary his croppings by his judgment, and keep one-fourth more stock on his land ; it would create a new demand for labour, by which alone can the labourer have a permanently advanced wage.

I think I have shewn the necessity of, and pointed out some of the advantages to be derived from, tenant-right; I have also shewn in part that it will not be landlords' wrong. I can only add—let the example of Lord Leigh be followed; you will obtain higher rents; you will have men of capital for tenants; your estates will be increased in value, will be improved and better cultivated; your cottagers will be better paid and better cared for; you will see the effect of progressive industry strengthening every movement. One great result will be an independent tenantry —manly, but not servile. Who would not like to cultivate that noble principle, and see it developed in every man — a principle by which we have, as a nation, arrived at our present position of greatness, and a principle by which alone we can hold our own in competition with the world?

VALUATION OF LAND.

THE letting of land grants an occupation of the ground for a specified time, at the end of which, removals and changes of occupancy very frequently happen from differences, failures, dislikes, and private wishes. No term of the year, says a writer, "J. D.," in the *Mark Lane Express*, can be found at which a free and clear quittance can be made without the out-going tenant leaving articles that are fixed and incorporated, and which cannot be removed or taken away. The value cannot be realized by any present method, but which must wait the returns of crops and seasons.

In the early records of the tenancy of land no notice is found of any compensation being made for alterations or improvements, or that any idea had been entertained on the subject of valuations. The use crept in very slowly, and required much time, along with a concurrent force and pressure of circumstances, which is ever necessary to establish a permanent arrangement of any business or negotiation. The stipulation was early introduced, which gave the tenant from the landlord the raw materials of repairs, as rough timbers, stones, and lime.

The land was used in the triennial cultivation of one-third in the process of fallowing; one-third sown with autumn grains; and one-third in Lent crops. All articles were transferred wholly free and without consideration at the end of any tenancy; the grain crops were reckoned equal in quantity to the giver and receiver, and the arable lands in the same condition of quantity and preparation. The simple condition of tenancy had lived with little or without any alteration till about the middle of last century, when the introduction of green and forage crops wholly revolutionized the entire system of agriculture, and fixed a new era in the practice of the art. The crops of different plants succeeding each other altogether, varied the labours of cultivation, and very much intermingled the periods of return and the kinds of produce. The nature of the cultivation of land requires a time during which to derive the compensation of outlay of money. The cost of raising a green crop of roots cannot be repaid by the crop itself, as the benefit is extended over the succeeding crops of the rotation. No other business of life is so closely bound to this natural law as agriculture, and a greater risk is incurred during s
seasons, which may be favourable or ad
and the prices of produce are fluctuatin
uncertain, demanding a wide considerat
the peculiar circumstances that surroun
employment. The original mode of trans
not provide for the increase of produce tha
from an improved system of cultivation
would leave the out-goer wholly deprived
value of much labour and expense. The a
ment prevented all the confusion that arise
the mixture of new and old tenants bein
ployed on the farm, and it has left its vesti
the yet remaining custom of farm-yard
passing free from the old tenant to the
Even this arrangement is objectionable,
improved management of one tenant ma
duce a greater quantity of dung at the end
lease than was received at the entry. T
crease will arise from a greater quantity of
being produced, which is trifling in comp
with the quantity of grain that has been th
from it, neither of which was provided a
by the primitive arrangement of a free tra

TERMS OF LEASES.

It was very early perceived that no peri
the year could be found at which the te
land might be terminated without an expen
of labour and money remaining unpaid
tenant who left the occupation. The ter
the year were adopted from the saints' d
the Romish calendar, which were fixed i
months as the times occurred. The ma
feast-day, of a saint became a period of
and was used in the purposes of socia
The feast of St Michael was fixed on 29t
tember, and very early became a term of
utility. Martinmas, or the feast of St M
was fixed on 11th November. Candlema
fixed on 2d February, and so called fro
number of candles used at the ceremo
Purification. Whitsuntide was fixed in M
the early converts then appeared in
Ladyday in March, so called from the a
ciation of the Holy Virgin. The term of
tinmas is not very distant from Michaelma
is found in the same state of the farmin
duce. Candlemas and Ladyday are
placed, and are very similar in the abov

the manufacture of the crops not being
l that was begun at Michaelmas and
mas. The two chief terms of comparison
May and Michaelmas entry.

Michaelmas term in September is the
eriod of time that was used in entering
itting the temporary possession of land.
ined the first preference with clerical
who granted the first leases of land, and
itinued in use over a large part of South
. The whole labours of the year come
w in the maturity of the crops of grain,
ing of root crops, the preparation of clay
for wheat, and other minor articles of
The whole assemblage is due to the out-
enant, to be valued to his credit and paid
ehoof. The hay in ricks is valued at a
price, or the value reduced by the ex-
of carrying it to market; the straw is
y valued, or given wholly free—the
of hay and straw being ever most ex-
reserved to be used on the farm. On
int no omission or relaxation has ever
nade in all inland situations, where
s cannot be obtained in the full return.
rns are used during winter for the pur-
threshing the grain crops by the out-
enant, who gives the straw and chaff in
ases for the delivery of threshed grain to
rate distance. The fallow lands of bare
nd of root crops are valued in the rent
es of one year—the workings and manure,
any seeds sown. Dung in heaps; grass
one or two years, in a-half or a-third of
nd labour; copse-woods, by the years of
; hop gardens and poles, with minor
of fruit trees and bushes, are all valued
-known rules, that are much varied by
istoms, which differ in the special articles
subjected to valuation, and also in the
lowed for compensation.

PAYMENT OF RENT.

payment of rent by the out-going tenant
on the 29th September, and at that period
connexion must be severed and wholly
inued, to prevent the unfriendly inter-
s and unpleasant collisions that happen
the winter's use of the barns by the out-
enant, who may remove to a distance of
nconvenience. The improvement in this
f quit and entry would be that the in-
tenant purchase the grain crops just be-
turity, when the reaping and storing may
inconvenient from a distant abode. The
rops may be reaped and ricked, as is the
hay, by the out-going tenant, the contents computed by measurement, and the value fixed; the appearance of the stubble will guide an experienced judgment to reckoning of produce; and the two estimates being added and divided, the half of both amounts will constitute an equitable estimate of value. The amount of valuations may be somewhat lessened by the underwood being wholly managed by the landlord, when the farmer buys at the neighbouring sales of cut articles a quantity for his use, which will prevent the frequent misunderstandings from the landlord preserving a number of standard trees for timber, which damage the undergrowths. Timber trees and copse growths are best produced in separation.

TIME OF ENTRY.

The Whitsuntide term, in May, presents a more clear separation between the out-going and in-coming tenant than the terms that have been mentioned, and has obtained a more extensive application in the leases and lettings of land. At that period the entire crops of grain and roots have been wholly expended in the application by the out-going tenant, and no value remains unattached on these two very principal articles of produce. The grain crops sown in the spring of that year are the property of the out-going tenant, and there remains for adjustment only the small account of the grass seeds and labour expended in the previous year, which will be grown into a crop of hay for the in-coming tenant. The straw and dung remaining on the farm at the term are conferred to the use of the farm, free from any charge of value from the old tenant to the new. This practice is a remnant of the old arrangement, which transferred the whole crops of all kinds to the new tenant without any value or discrimination, which chiefly prevailed in the southern counties of England, where the Michaelmas term was mostly adopted. In North Britain, the term of Whitsuntide had the largest application, and the practice was the most used of transferring the straw and dung free of any charge or value. Such goods were called "steelbow," from the Teutonic, "stellen," to place, and "bovv," a field, as being goods placed on land, and attached to it, which were often delivered to the tenant, by the landlord, and remained as his property, and to be re-delivered at the expiry of the lease. The word being confined to Scotland, may be of Scandinavian origin, and merely an inversion of the Swedish "bosteele," a residence or fixed abode. The practice has prevailed from time immemorial, and has acquired a very high reputation as a most beneficial arrangement, and prevents the accumulation of valuations to press upon the in-coming tenant. In one sense the truth is undeniable, though a correct feeling of justice and a true sense of equity will reckon the dung and straw as a moveable article, and worth a value to the out-going from the in-coming tenant, as it has been produced by the previous crops, and from the excrements of animals, all of which articles are exclusively the property of the out-going tenant. The condition must be express that it be purchased by the in-coming tenant, and a greater quantity may be produced at different terms to alter the equitable interchange of the commodity. But the custom has been long established, and the equity of it is not challenged.

The May term of entry to farms has long prevailed over the whole extent of Scotland, and over the north of England. It has been most justly held to be the easiest and most accommodating to both the parties who quit and take possession of the farm. At no other period of the year is there found so complete a separation of the crops and labours of the farm, nor any time at which so fully the processes are ended and being commenced. A wholly entire separation never can be got—the labours of one year are extended into the next, crops sown in the end of one year are reaped in the next, lands are ploughed and fallowed in different seasons, and the grazings of one year are repaid from the following produce that is realized. The grain and root crops are the chief articles of produce, and demand the largest consideration, as from these sources all other productions have their origin. Hence, the foremost place that is ever enjoyed by these productions of the ground. All the straw and hay of the farm are manufactured and converted into dung lying in the yards, or carried to the fields into heaps, and the pasturage of the grass fields has not commenced by a mutual understanding and the general custom, or is expressly arranged by agreement in the lease or tenure of the lands. Grass seeds have been sown the previous spring on the barley and wheat lands after fallowing with manure, and come forward for a crop of hay in the first term of the new occupation. Hence the value of seeds and labour is due to the out-going tenant, who has made the expenditure and has not reaped any benefit, to be paid by the in-coming tenant, who will derive advantage from the crop of hay.

The advantages are very great, and well
understood, of winter ploughing the st
intended to be fallowed for green
autumnal wheats during the next su
subsequent cultivation of the soil ca
pensate for the want of its expos
vicissitudes of atmospheric influe
the winter months. The old and
ing custom gathers a number of pl
the neighbourhood to a "ploughing-
to the new tenant, when the work is
fectly done in a hurry and confusio
often at an improper season. The d
early green crops is beneficially place
during the late winter or early spring
performances of ploughing the stubbl
of carting the dung is paid to the
tenant by the current rates of labour,
any work done in preparing the lands
crops. These labours are of nece
done to prevent any damage to the
change of occupancy.

VALUE OF MANURES.

The value of auxiliary manures, as
and guano, is awarded in a tenant-ri
years on the original cost and la
quantity of dung in the cattle yards m
puted by allowing a certain quantity
of straw of the previous grain crops.
tion of grass leys of one year, and o
yard dung that has been applied fo
has obtained only a bare mention
scarcely advanced into notice once.
be thought expedient to increase the t
at the quit and entry farms, which sh
and easy, and exhibit the least possi
ance of change.

The Lent crops of grains grow into
the property of the outgoing tenant, a
by auction in lots to the highest b
carry the lots to different localities.
straw are brought back to the farm
way, which creates much labour and
and an unnecessary loss of time. Th
of the crop just before maturity wil
considerable improvement on the ol
a public sale, but it continues the
after the term of quit, which shoul
destroyed, and prevent the incon
distant abodes of business.

The rent of the farm is paid half-
six months' grace, with the power of
the payment of the full amount at th
if the farm be vacated at that ti
arrangement does not remove the ano
in-coming tenant paying the first hal

ds producing crops that are not his pro- The purchase of the grain crops prevents iblic sale, but continues the connexion of it and entry.

s now proposed to break this "steel bow" gement, though the equity of it has not challenged, and to sever the whole con- n on the term-day.

BREAKING THE "STEEL BOW."

e following arrangement of valuations trans- he grain crops on the day of quit to the enant, who pays the rent half-yearly, and e expiry of six months from the entry:—

Clay Fallows for Wheat.

One year's rent and taxes, full value of til- , dung, seed, and sowing.

Green Crop Lands.

Full value of tillages and dung on the crop of the previous year, but no rent and taxes, crop has been got.

3. Full value of ploughing, seed, and sowing the grain crops of the present year.
4. Full value of the grass seeds, and sowing of the previous spring.
5. Full value of the winter ploughing of stubbles.
6. Full value of any cartage of dung.
7. Full value of the dung in the cattle-yard.
8. Value of one year's grass leys in pasture.

The in-coming tenant now pays rent for lands producing crops that are his own, and all connexion is wholly severed on the term-day.

Objections may be raised against valuations in cases of none being used, as the general desire wishes the abolition where the custom is most prevalent. The May entry has attracted notice from these localities, and it is hoped the arrangements now suggested will appear to be just and equitable, and worthy of being adopted into practice.

Farm Architecture.

PRESERVING TIMBER FOR BUILDING PURPOSES

TIMBER which has been thoroughly well seasoned may in one sense be said to be in that position in which its good qualities will be preserved, so that the seasoning and the preservation may be said to be synonymous terms. But although this is true, it is also true, that although we may, and in practice sometimes do, get wood thoroughly seasoned—that is, give it properties by which it will be preserved—still we in practice put that timber under conditions in which it loses those properties and begins to decay. In other words, we, by seasoning, give it certain discernible qualities, which, by preservation, we enable it to retain; hence the two processes are in practice essentially distinct. The most obvious mode of preserving timber from the causes which bring about decay, is the old-fashioned one of painting its outer surface. That this is effective only under certain circumstances, we all know—for paint itself, under the action of the atmosphere, rapidly decays, exposing the timber to the same. A very effective way of using paint on wood-work used externally, and rendering its effect much more lasting, is to go over the surface with a drying oil, and when this is wet, carefully strewing clean sharp river sand over the whole surface, and then finally painting this surface with the ordinary paint of the desired colour. In place of [illegible] of drying oil, the ordinary [illegible] for the [illegible] ons, such [illegible] good preservative [illegible] lasting when used in conjunction with [illegible] river sand, which may either be mixed with the tar and the mixture painted in, or the tar may first be put on, and the sand strewed over the surface while the tar is wet. We prefer to use the two modes in co that is, putting a small quantity o the tar in the first instance, and pa surface, and finally strewing the san whole. An excellent method used places on the Continent is the empl crushed shells, as cockle and mus which are strewed over tarred sur very pleasing effect is given to the s treated, by the varying colours of The preserving effects are said to be ing. In preventing the attacks of wood, a paint made of 100 parts sulphur, 15 parts of manganese, of manganese, is used on the Cont effect. Another surface preservati spoken of is made up as follows :— 15 parts; resin, 15; tar, 5; white any colouring material, 4; cement, of iron, 9; glue, 2; hydrate of chalk 15; litharge, 2. The whole to be reduced to one-tenth of the original applied hot.

As in the case of the other exteri tion already described, so in that of essential that the wood be well seaso it is applied. No matter how good i preservative coating be, it will no but rather promote, the decay of the which it is used, if that wood be m interior. To paint or apply to the wood in this condition any preserv ing, is like leaving vermin inside a c and locking them in; the wisest get rid of the internal wasters, and out. Hence it is, that if a plank, timber, be fitted up, and one-half e the weather in its natural or ord dition without paint or other coatin other half exposed and painted, we on examining the timber, that the

ough surface-cracked and weather-
is by far the soundest. The internal
:, or sap of wood, is the first thing to
rid of; then this being done, outside
.tives may be applied with advantage.
is sometimes preserved by subject-
the smoke of certain combustibles.
ct of smoke, especially that of wood,
preservative of timber, has long been
The timbers of the open roofs of the
Age houses, which were often exposed
moke of burning wood issuing from
ı and otherwise defective fire-places,
d, in their blackened condition, to be
ay in the highest state of soundness,
ı doubtless much of this is due to the
of air to which they were also ex-
The following is a description of a
adding to the durability of home-
mber, or scantlings of small size of
timber, by exposing them to the
f burning twigs of birch and beech-
-"The action in this case is exactly
ch takes place in smoke-drying fish,
)sote of the smoke coagulating the
of the wood with which it comes in
The simplest means of smoking
d is to pile it loosely together in
l building, all the voids of which can
: closed up. In a vacant space re-
ɔr the purpose, a quantity of birch or
pray should be set fire to, and the
s being all securely closed, the interior will soon be completely filled with smoke. After a day or two the door should be opened, and the process repeated. According to the size of the wood, the smoking should prove effectual in its preservation, if from four to six strong applications are made. After the piles are arranged, very little labour is required in burning a fresh quantity of spray every alternate day or so. To secure the full effect resulting from this cheap and simple process, the wood should be air-dried during a summer previously; and in putting it into the building, it will be advisable to lay it in a direction slanting slightly upwards with the butt-ends a little off the ground. If the sticks are standing with the butt-ends close on the floor, the entrance of the smoke into the pores of the wood will be somewhat obstructed." The writer of the above remarks was not aware when he penned them that Mr Bethell, the inventor of the creosoting process of preserving timber, had, for some years, been in the habit of drying wet logs in a somewhat similar manner, preparatory to their being saturated with the preserving oil. By smoke being made to circulate through a drying-house in which the wood is piled, he not only succeeded in seasoning it in a way which fits it to receive the creosote, but he also, to a great extent, preserved it, as the volatile creosote present in the smoke penetrates the wood considerably.

Our Pasture Grasses.

POA FLUITANS (Hooker and others), FLOATING MEADOW GRASS.

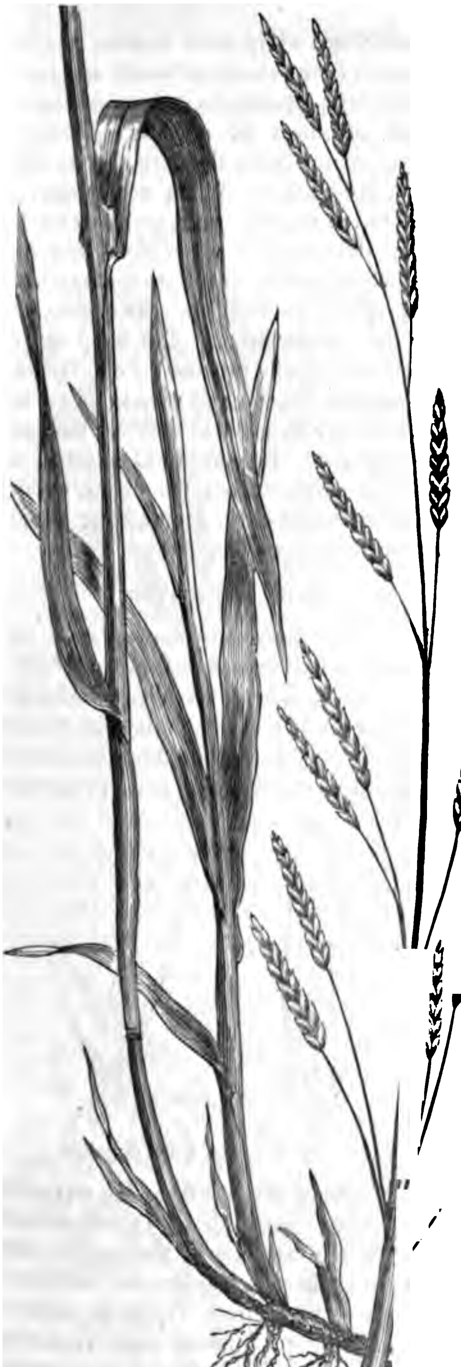
SYNONYMS.—*Gramen Anatum*, or duck's grass, of H. Tragus, 1552. *G. fluviatile*, and *G. aquis in*
or flote grass, of Gerarde, 1597. *G. aquaticum fluitans*, of C. Bauhin, 1658. *G. loliaceum flui*
R. Morrison, 1680. *G. mannæ esculentum prutinecum*, of John Lossel, 1703. *Poa spiculis oblongi*
of A. Royen, 1740. *Festuca fluitans*, of Linnæus, 1753. *Glyceria fluitans*, or floating sweet g
R. Brown, 1810. The *Flote fescue*, of English agricultural writers, also known by the names o
millet, Semolina, Manna grass, and Manna-croup grass.

DESCRIPTION.

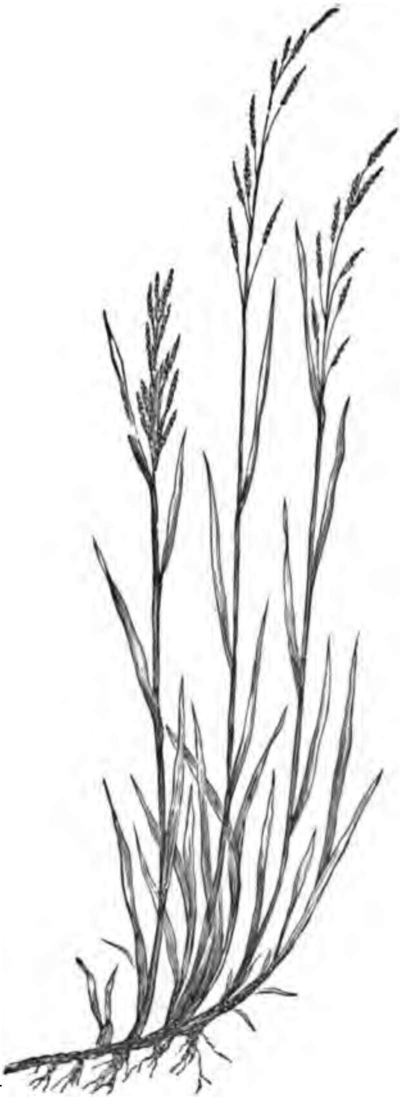
ROOT perennial, fibrous, and progressively produced from the joints of the decumbent stems. Lower portion of both barren, and fertile stems decumbent, the latter ultimately assuming an upright position, cylindrical, smooth, having about seven smooth joints, and, including the panicles, usually from 2 to 3 feet in height. Leaves somewhat roughish on both surfaces; long, linear, flat, and bluntish pointed, more especially those which float on the surface of the water in early spring. Those of the fertile stems with roughish finely-striated sheaths, the upper ones generally more or less folded, and furnished with prominent centre ribs, which extend down their sheaths; the uppermost leaf shorter than its sheath, and furnished at their junction with a long ragged-pointed ligule. Inflorescence in erect or slightly bent, long, loose, spike-topped panicles, which are usually simple, but on luxuriantly growing plants, occasionally compound; the branches, mostly in pairs, but sometimes in threes, spreading somewhat horizontally when flowering, but afterwards more upright or inclined to the centre stem or rachis. Spikelets distant or thinly arranged, long, linear, variegated with green and white, but when growing in dryish sunny places, sometimes edged with purplish brown, each spikelet containing from six to fourteen florets or seeds, of which the summit of the lowest extends considerably beyond the calyx, which is composed of two very unequal, blunt-pointed, memb
glumes, or outer chaffy scales. Flore
of course the seeds, without the downy
like appendages peculiar to some others
genus; the outer palea of lowest floret
ribbed, the dorsal rib, which scarcely e
to the summit, being minutely t
throughout its length, and the side ri
more or less rough, but destitute of
The inner palea is somewhat shorte
the outer, bifid, furnished with two
marginal ribs, and minutely fringed
upper half. Flowers in greatest abu
from the middle to the end of Jun
ripens its seeds in from three week
month after, so that, unless in late sea
at high altitudes, these are usually pe
by the end of July, although a parti
cession from later flowering stalks co
ripening for about two months after.

NATURAL DISTRIBUTION.

This grass is common in clayey and
bottomed shallow waters and marshes,
sides, in sluggish flowing streams, and g
occasionally overflowed by fresh
throughout Britain and other count
Europe, as well as Northern Asia and
America. It has also been found in Au
and is represented by allied species i
Zealand and other temperate regions
southern hemisphere. Throughout Br
is most abundant at low altitudes, be
comparatively scarce at elevations o
feet, but occasionally found as h



Poa fluitans—natural size.



Poa fluitans—reduced figure, shewing habit of growth.

2500 feet in sheltered places. Although an aquatic, it thrives well on suitable soils that are marshy in winter, or occasionally under water, although they may become dry in summer; hence its frequent appearance where, at times, there may be little else to shew the need of drainage.

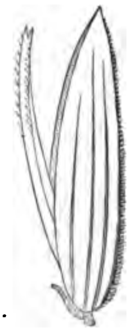
QUALITIES AND USES.

The young floating leaves of this grass are among the earliest examples of spring vegetation, when they form acceptable feeding for geese, ducks, and other water fowl, while by their greenness, as well as sweetness, they occasionally tempt cattle into dangerous depths of muddy bottomed waters, in their endeavours to reach them; although when more matured they become less palatable, and the herbage is more suitable for soiling and fodder than for pasture. Hence it forms a useful adjunct in mixtures for growing on river banks that are occasionally overflown by fresh water tides, as well as on lake shores, or other grounds that are subject to inundations, and on irrigated meadows. Although naturally a sub-aquatic, yet, when once fairly established, it permanently maintains its place in moderately dry grounds; and when its natural habitats become thoroughly dried up by extreme drought, it continues to grow after most of the associated vegetation has withered away. Grown on a strong tenacious clay in the Woburn Grass Garden, where it annually increased in growth, it yielded, in the fourth year, at the time of flowering, at the rate of 13,612½ lb. of grass per acre, the loss of which in drying was equivalent to 95,283¾ lb.; but neither the product of its early herbage nor its aftermath is recorded. Nor do these results give any reliable indication of its yield when grown on irrigated or naturally flooded ground. Its late autumn growth is, however, comparatively scanty, and its cultivation is only advisable under the peculiar circumstances before mentioned.

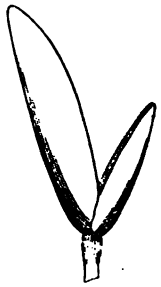
Poa fluitans is further entitled to rank among the cereal or corn grasses; for its huskless or clean seeds, under the names of Polish millet, manna-croup, and semolina, are used, both whole and ground, in soups, gruels and puddings, while meal or flour prepared from them forms excellent bread, and in various culinary preparations is deemed superior to that of wheat for invalids. Under the name of manna-croup they are purchased for feeding gold fishes. When nearly ripe, the seeds are remarkably sweet, and they are then eagerly devoured by water fowl and other birds, while, as they drop into the water, they afford agreeable food for carp, trout, and other fresh-water fishes. Our shop supplies of these are chiefly procured from Germany and southern Russia, and vary in price from 4d. to 6d. per lb.; but as they are yielded in great abundance in many rural districts, and are easily stripped from the stems, children and others might easily secure large supplies for home use as well as for sale.

SEED AND SOWING.

In their unhusked or natural state three seeds and a-half measure about one inch in length, and weigh when fully ripened fully 20 lb. per bushel, although, as sold, they are usually about 5 lb. lighter, from the difficulty of harvesting them when properly matured, in consequence of their dropping off readily. In the latter state, about 33,000 are contained in one ounce, and the greatest number braird when merely covered with mud; although it takes from 1½ to 2 inches of that covering to prevent their vegetating. To ensure the thickest braird it is essential that the seeds be covered either with mud and water, or at least by very wet soil; and although it has been asserted that they will not vegetate in ordinary arable land, we have

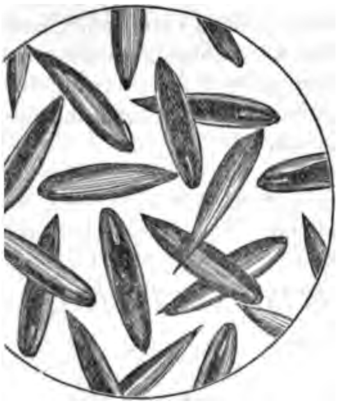


Floret magnified.



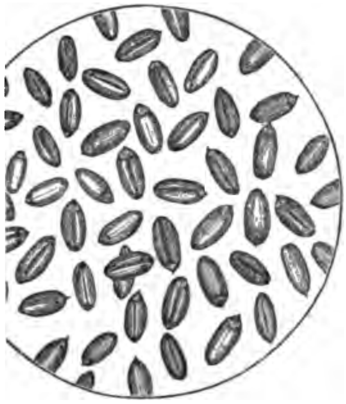
Calyx magnified.

d no difficulty with them when Februsary or sufficiently early in have the full benefit of the then oisture, before the setting in of ught. In mixtures for irrigated



ans—Seeds magnified to three diameters.

or fenny ground, the seeds may be l in quantities of 4 lb. to 6 lb.; but rtain mode is to dibble in from 4000 lants per acre. When intended for nd sheltering water fowl or fish, o lb. per acre may be sown on the any time between that of ripening llowing April or May; but fastening o balls of clay, or fixing them to



—Naked seeds magnified to three diameters.

d dropping them into the water, at d distances, will generally be found satisfactory mode of propagation. less or clean seeds when magnified, in the accompanying engraving, bear some resemblance to wheat in form; they are of a dark brown colour, flinty texture, and in length are about nine to the inch; so that they are not half as long as the unhusked seeds, which, it may be remarked, bear a considerable resemblance to those of common rye-grass, but are easily distinguished from that and others of like size and form, by their seven-ribbed outer palea or adhesive chaff scale. When the seeds are thoroughly ripened, the grains or kernels are easily separated by rubbing, which, of course, is still more readily accomplished when they are well dried by kiln or otherwise; and as the so-called flour is usually only rough ground, it may be prepared for family use in a small hand mill.

CHEMICAL ANALYSIS.

As this was not among the grasses analyzed by Professor Way, of the Cirencester Agricultural College, in 1849, we have only that published by Sinclair, of Woburn, in 1824; according to which, the yield per acre of nutritive matter at the time of flowering was equivalent to 372 lb. 3 ounces, or about 67 lb. more than Pacey's rye-grass; but, as before stated, the soil and situation in which the crop grew there, were by no means suitable for its full development.

VARIETIES.

The following are the two principal varieties of the Poa fluitans, neither of which are superior to that we have described, which is by much the most prevalent form, as well as the most productive of both grass and seeds.

1. *P. f. brevisperma*, or short-seeded sweet grass. Although about equal in size of grain or kernel to the common, the adhesive seed scales or paleæ are much shorter, which gives to the seed sample a very distinct appearance. Its stems, as well as their panicles, are also shorter as well as more rigidly upright, and the latter are a good deal more branched. Almost exclusively confined to drier situations than the other, and has therefore been recommended as more suitable for cultivating in such situations; but although its seeds may be occasionally obtained genuine, they are in little demand.

2. *P. f. subspicata*, or spike-like sweet grass. Dr Parnell, who first figured and described this variety, states that it is distinguished from the common by its leaves being narrower and more acute, the inflorescence of a spike-like form, and the anthers nearly double the size. It is a frequent grass in Scotland, growing by margins of pools, in slow running streams, and in moist ground of the richest kind. When entirely destitute of branches, it bears much resemblance to the Festuca loliacea, but may be readily detected by the much longer ligule at the jun upper sheath with its leaf, and palea, or seed scale, having seve five prominent ribs.

3. *P. f. variegata*. This bea gated-leaved variety was found by Messrs Charles Jenner and Ch in 1868, when they also discov teresting as well as showy adc British flora, the new Scotch thist Carolorum.

THE BUNCH GRASS OF BRITISH COLUMBIA.

(ELYMUS CONDENSATUS.)

THE description and engraving, from a photograph, which appeared in this Magazine in January last, of a plant of the Bunch Grass that grew last year at Trinity, in the vicinity of Edinburgh, having both been reproduced in "Moore's Rural New Yorker" of 2d April, and pretty widely noticed in other foreign as well as home agricultural periodicals, we have had numerous inquiries regarding that highly-promising *herbage* and *forage* plant, such as, How it stood the unusual severity of the past winter? Whether or not its seeds vegetate freely? and, What has been its progress this season up to the present date? To all of which we now submit the following replies:—

Its perfect hardiness and suitability for the climate of Britain is unquestionable. The old plant above referred to, as well as numerous young ones reared from seeds sown in [illegible], and even younger ones with only [illegible]o leaves, from seeds that were [illegible] the time of their ripening, in the first [illegible]st, have all withstood [illegible]ate protracted winter without sus[illegible]st injury.

Of the seeds sown, [illegible]fore stated, in the first week of Septem[illegible] only about a-third vegetated last autumn. Of another quantity, sown in the last week of that month, none came up till about the middle of April, when they, as well as the remainder of the first sowing, brairded freely, and most of the are now from 9 to 15 inches i stronger ones pushing out two c shoots. Of seeds sown in Apr 80 per cent. brairded, and most o are now from 6 to 12 inches high quantity, sown in the first week c month, less than half the above have come up; but as these l vested earlier, or when scarcely n not kept along with the others, failure may have arisen from othe that of long keeping. Lastly, a seeds sent home by its introduce Brown, from British Columbia, i sown for experiment in April la vegetating power seems to ha stroyed by long keeping, as no appeared.

The old plant which we had p last year, and which then stood 8 high, had a thick growth of you herbage on the 4th of May, measured 3 feet 4 inches; and sho exhibited that day in the Edinbu change; as well as at a meeting burgh Chamber of Agriculture, v tation from the paper manufact district, for the purpose of pr cultivation of plants useful for pa By the 15th of May an additior gained, making the height then 4 f n the 9th inst., the edges of the spikes began appear, bursting from the upper leaf sheaths, hen the height of the plant was 5 feet 4 in.; nd at the present date, 20th July, although one of the spikes are wholly protruded, the eight is fully 7½ feet, so that the plant bids air to exceed its height of last year, although t has had no advantages either from shelter, vatering, or manuring; and it contains fully noret han a hundred seed-bearing stalks; beides an undergrowth of barren or leafy stems, ome of which description, at the time of eed-ripening last year, were about as long as he fertile ones. The young plants, from seeds sown in June 1869, now measure from 15 inches to 2 feet in height; but none of them are likely to run to seed this season, although they will doubtless be fine bunchy seed-bearing plants next year. Whatever may be its other qualities, and these promise to be both varied and important, it far surpasses all other grasses in that of earliness; and ground cropped with it is likely in ordinary seasons to yield a heavier cutting in the second week of May than Italian rye-grass will do at any period of the season. The plant, which forms the special object of this notice, as well as the younger ones above alluded to, are growing at Rait Lodge, York Road, Trinity, near Edinburgh, where they can be seen by any one who may take an interest in the introduction of new and valuable agricultural plants.

The Farm.

FARMING AND FARMERS IN NORFOLK.

THE farmers of Norfolk had what may be called a gala day on the occasion of the holding of their Annual Live-Stock Show in the little town of Harleston. Our business is to note some of the after-dinner speeches which were spoken by eminent men in the agricultural world, and not so insequential as those which usually fall from speakers' lips at such gatherings

> "Across the walnuts and the wine."

From most of these speeches, it would appear that, while standing high in agricultural repute, Norfolk is still by no means all that is perfect in her husbandry. She has still much to learn and much to improve on. Sir W. Jones was the first to strike the keynote with reference to making the land in the county more profitable. He thought the routine and monotony of their crops were capable of being somewhat varied; that the climate of the county was manifestly becoming dryer and hotter through the extradition of hedges and hedge-row timber; and it was known, mangolds were always a finer crop in a dry and sunny spring and summer. Reasoning from these premises, Sir W. could not see there was any reason why farmers in the county of Norfolk could not grow excellent crops of Silesian beet, a root which, he reminded his listeners, contained no less than 10 per cent. of purely crystallizable sugar. A 10-ton crop, therefore, which would be the average crop in Norfolk on an acre, would yield a ton of sugar, which at 2d. per lb. would realize £18, 13s. 4d. If they had proper mills, and the sugar duties off, a cwt. or two of beet would be just as saleable as a bushel of corn is in the market at present. He referred to the amount of money that was made on the Continent of Europe and the Indies, by the manufacture of sugar—a commodity which "old and young could eat with pleasure, and the consumption of which would increase to any extent;"—and went on to say he could not see why we should not be able to manufacture it here as well as in Belgium. And there is certainly, so far as we can see, no insuperable obstacle in the way of doing so in our country. "Go on to the Continent of Europe," continued Sir W., "and see the sort of land and farms on which they grew beet there, and then say whether, with our appliances and means, with our intelligence, with our excellent roads and railways, and our enormous command of artificial manures, we could not be successful in this matter. As to the manufacture of artificial manures, the bones of the old Egyptians were being shipped into England for this purpose; and the country which has the energy to bring guano, superphosphate of lime, and artificial manures from all parts of the world, might grow a good crop of sugar, and with profit, if the county members would only get the sugar duties taken off."

Mr C. Sewell Read, M.P., followed Sir W. Jones, and quite agreed with him that it was very important Norfolk should have some new crop to fall back upon, if possible, to meet such deficiency in the cereal crops as this year would be experienced. "There can be no doubt whatever," said Mr Read, "that the potato crop in Scotland has been a perfect god-send to them after free trade was introduced; and the only thing I can say is, that I look upon agriculture in Norfolk, and in the eastern counties generally, as going from bad to worse—that whereas they in Scotland and Ireland can grow roots and grass to the best advantage—and the proceeds they make are not at all affected by free trade—

this county, being entirely a corn
district, do feel the depression most
y. I have never myself had any expe-
in the growth of beet-root sugar, and
say it is a problem that has not yet
lved whether it may be advantageously
in this district ; but I do say that we
ne article, and that our chief, in the
of which we can compete not only
the United Kingdom, but against the
world—that is to say, our barley. And
t saying what I should wish to be done
e sugar duties, I can only say I should
have first a very sensible repeal of the
ax. "Going from bad to worse" is not a
ful description of these counties, which
nerally looked upon as in the foremost
f agricultural progress and prosperity.
ad then went on to inveigh against the
uation of the Malt-tax : the concessions
to farmers with reference to the germi-
and steeping of grain being, he main-
, practically valueless, and he for him-
uld never think of availing himself of

Having briefly referred to the con-
which Government had been forced
e with regard to the duty on agricul-
orses employed in drawing material for
ng roads, Mr Read turned next to the
eration of the votes of money to the
nary Department of the Privy Council,
he does not appear to think have been
ell spent ; and we confess that the use-
ults from that Department are not so
ctory as the amount of money spent
warrant us in expecting. £25,000
her is spent in this Department,
oo in salaries alone, the rest in the
ion of statistics. But the money might
to far better uses. We perhaps do not
ite as far as Mr C. Read in his
the worthlessness of this Department,
icated in his question, at the Harleston
"I ask you, as practical farmers,
r you believe the Veterinary Depart-
f the Privy Council has ever been any
t to you whatever; or, on the other
whether, while costing you £10,000,
been of ten thousand pence benefit to
Mind you, I am quite ready and willing to admit the great service the veterinary profession themselves — Professor Simonds and Professor Brown—have rendered to us ; but, on the other hand, when I come to consider the extraordinary salaries that are paid for this Department, and that in addition to this there are £15,000 a-year spent annually for the collection of statistics, I mean to say that if we had that £25,000 devoted, as it ought to be, to some Agricultural Department of the Board of Trade, that we really might have then some substantial benefits conferred upon us."

We cordially agree with the speaker that an Agricultural Department well managed would, with the like sum of money at its command, conduce far more to the farming interest than the operations of the Veterinary Department of the Privy Council now do.

Coming back to the character of the farming in Norfolk, from which, following Mr C. S. Read, we have a little digressed, we find Mr Charles Howard, of Biddenham, who acted as one of the judges at the exhibition, telling the farmers of that county that they are not up to the mark. The shorthorns at the show were, no doubt, fine specimens of the breed ; but they did not belong Norfolk men, they came from outsiders. "You have long," said Mr Howard, "been held up to us in distant counties as patterns of agriculturists, and as a county in which there is the best farming in the world. Now, I have had the opportunity of seeing a good deal of farming in Norfolk during the last few days. I am not going to find fault with your farming, but I should tell you this, that if you don't look out, you will no longer hold the position you have done—that other counties will very soon trip you up, and you will lose that position you have so long and so worthily held. There is one other point to which Sir Willoughby Jones has referred—the change of climate produced by the cutting down of hedge-row timbers and woods. Well, it is certain that has not had that effect in Norfolk, for I never was in a county in my life where I saw so much useless hedge-row timber. I am quite certain of one thing—that the farmers of Norfolk do all they can to meet the exigencies of the times; it now rests with the landlords to help them. The first thing they should do would be to allow them the privilege of cutting down this beastly rubbish—pieces of timber which, if they stand fifty years, will never be worth a sovereign—to cut down many of the hedge-rows and to destroy the great pest of the farmers—the tenants of these wild hedge-rows (rabbits)."

Mr Overman, also a noted farmer, followed in the same strain as Mr Howard—"We are living in critical times, and unless the landlords go-ahead as fast as the tenants had done, good-bye to their having any tenants at all. There are three things most important to landlords, but very few people liked to tell them what they are; however, he would make bold to do so. First, as to hedge-row timber and hedges, that was land rented to the tenant and unproductive; therefore, it behoved the landlord to take the hedges down, and thereby the timber. Cottages—they were the property of the landlord, and he ought to provide them. Next came a more important subject—the game question. If the landlords persisted in the over-preservation of game, he did not hesitate to say they would have to farm the land themselves. The misery of this might first of all fall upon the tenants, but it would afterwards come upon the landlords, and perhaps many of them would be able to find neither the capital nor the ability."

We trust that the landlords and tenants of Norfolk will take the advice we have quoted above, in good part, and, acting thoroughly up to it on both sides, maintain their *prestige* among the agricultural counties of the nation.

MR MECHI ON THE CROPS.

THE following letter has been addressed by Mr Mechi to the *Times* respecting the crops:—Wheat will no doubt be our best crop, fine in quality, but somewhat deficient, perhaps, in yield, and certainly in acreage, a considerable breadth of wheat land having been ploughed up, owing to a misplant, and re-sown with barley or oats. Although the wheat plant is rather thin on the ground, the heads, which are now visible, are large and well formed, so that probably the yield will be very good in proportion to the straw, which is much shorter than that of last year, and less flaggy. In fact, the long drought, which has been so injurious to the shallow-rooted grasses, has greatly favoured the deep-rooted wheat plant, especially the fine white wheat, by elaborating the grain. As a rule, the failure of our first grass crop indicates a wheat crop of fine quality, as in 1868. The contrast of he weather of the present June with that of 869 is striking. Then, about the 15th, there were violent hail and rain storms, with a winterly temperature, which knocked down the heavily flagged wheat crops, and seriously impeded their ultimate development. Now all is different, and probably we shall scarcely see a prematurely laid crop of any cereal. This is a more unfavourable season for light-land farmers than even 1868, and must cause serious losses, unless we should be favoured with heavy rain shortly. These, falling on the dry and heated soil, would promote a rapid vegetation, and probably give large second crops of hay and abundance of late green and root crops. The first hay crop may be considered the worst we have had for many years. There are, of course, local and climatic exceptions to this, as in the south of Ireland and in North Lancashire.

Barley will be good in places on cool bottom land, though very short in the straw, but it is very deficient on all hot, thin soils. Potatoes are generally very healthy, and promise to be a good crop. Oats on well-farmed clays look promising. Beans are very short in the straw, but well-bloomed. Peas, a poor crop on light soils. Mangolds plant well where the land has been manured and deeply cultivated before winter, which is best for all root crops. The fly has destroyed the early sowings of swedes in many places.

When we consider that one-half the kingdom (22,500,000 acres) is in permanent pasture, in o 7,500,000 in green and root crops, and 0,000 of acres in grain crops, the loss of milk-making substances in the first ust be very great and injurious to the farmer.

untry and climate are undergoing con- changes, and we should adapt our crops ered circumstances. By drainage and moval of woods, fences, and trees, we dered our climate and soil drier and and consequently more suited for deep- ants, and more hazardous for the shal- d. Wheat sends its roots down from ft. deep, and is thus a dependable plant season. Oats are also much deeper an barley. Clover and tares, being eper rooted than ordinary grasses, are e plants under our altered conditions. , with its deep roots and shining leaves, in our southern and mountainless and bright sunshine. Winter beans, rley, and winter oats will probably soon establish their superiority over late-sown spring crops.

I observe that winter beans and wheat have suffered very little from the severe winter on well-drained soils as compared with undrained lands. My own crops of every kind, except pasture, are very satisfactory on heavy land, but not so good on the light land.

Ireland this year is in a more favourable position as to her general crops. Nine-tenths of all our wheat are grown in England, and only one-tenth in Ireland, Scotland, and Wales.

In the United Kingdom, with an area of 45,000,000 available acres, we grow only 3,700,000 acres of wheat. My experience teaches me that we might grow much more wheat with advantage, and abolish much poor and unprofitable pasture.

On 170 acres of land I have only 14 acres of permanent pasture, but I grow wheat on 60 acres annually, following wheat occasionally with barley or bearded Rivet wheat.

CO-OPERATIVE FARMS.

RAL interesting experiments in co- rative farming have been tried lately in arts of the country, and are said to have y successful. At Assington Hall, in co-operative farm is established upon ving system, which, it will be seen, is nconnected either with the small-farm the allotment system :—The members gricultural company, but the land is not mong them so as to give each a piece to nd, in fact, they have no more to do cultivation than the shareholders in a mpany have to do with its traffic. The e divided among them every year, and artly in money and partly in kind, but nothing to do with the actual tillage of

Here is an important distinction be- is method of improving the position of rer, and all those which depend upon im an active cultivator on his own

-operative farm is not intended to be a turning the labourer into a farmer; except in point of money, any substi- e allotment. Under the system being the members continue ordinary day who work for the farmers of the parish y live at the regular wages, or they may work on the co-operative farm on the same terms, and if out of employment they have a preferential claim; but that is the only special benefit which they have. The only farmer in the case is the manager, who is paid very little above the ordinary labourer, and not above the rank of a peasant. He receives 12s. per week, and he is assisted by two other officials elected annually, who act as directors. The manager occupies what corresponds to the farm-house upon the estate, and he and his colleagues meet in council once a-week, when questions of cropping, manuring, and other matters are decided, but practically the whole working of the farm is in the hands of the manager, who stands in the place of the ordinary tenant-farmer. All the members must be agricultural labourers except six, there being a blacksmith, a wheelwright, a miller, a shoemaker, and two carpenters, so that the little settlement, which is also aided by a co-operative store, is complete in itself. No member is allowed to live more than 3 miles from the parish, to accept parish relief, or to retain his share if convicted of a felonious offence. All are compelled to belong to an approved benefit club, and at the death of a shareholder, his widow may retain his shares during her lifetime.

There are two farms at Assington, cultivated by different companies—one having twenty-one members and 133 acres of land; the other, 213 acres and thirty-six members. The latter farm was started by a company in 1854 with only 70 acres, but has been taking in new land continually. The expense of grubbing up the new and rough land has been considerable, and the dividend at present has been only small. The smaller farm, which was started earlier, is fairly in operation, and is doing well. In each case, the company was formed by means of a loan from the landlord, supplemented by the subscriptions of the members. The loan was £400 in each case; but in the first company, the subscriptions were £3 each, and in the second £3, 10s. The value of each share in the larger farm is calculated at £30, and the value of each share in the smaller —which yields at present a larger income—is about £50. The rent paid is about 30s. an acre, which is a little below the average rental of the neighbourhood. The original capital seems to have been about £7 per acre, which is rather below the amount which is thought desirable for farming. No interest was charged for the money advanced; the expenditure was and is limited entirely to the necessary expenses of cultivation. There is no establishment to keep up, and there is no "black-coated man" who has a mansion to maintain, or luxuries to purchase. The manager lives as a servant, and nothing goes in unproductive expenditure.

Every member gets a ton of coals, a certain number of sacks of potatoes, and one, if not two, fat pigs every year; but how much money is paid as a dividend to the members cannot be discovered with exactness. The general opinion in the village is, that the system returns nearly three times the profits which are ordinarily assigned to agriculture. For instance, it is commonly supposed that a farmer ought to make three rents. The rent of the co-operative farm is £200, so that the gross receipts ought to amount to £600. But if twenty-one members receive £25 a-piece, they divide £525, and the gross receipts ought to be £1575, or nearly *eight rents* instead of three. The land, though well cultivated, was not above the average, so as to yield a higher profit, and many farmers say it was rather below the standard than above.

The pecuniary benefits of this system are not, in my opinion, greater than what would be gained by a judicious development of the allotment system, which is calculated to confer the same benefits, and which is capable of being worked in the same way, providing a man had land enough to employ his whole time. But if it lacks some of the advantages of the allotment as the garden which the labourer tills with his own hands, it gives him a deeper interest in the soil, while it promotes the reappearance of small farms without the reappearance of small farmers. Now that the land question is occupying so much attention, the system of co-operative farms is well worthy of attention.

FLAX IN RUSSIA, BELGIUM, AND HOLLAND.

AMONGST the reports published by Her Majesty's Secretaries of Legations, there is one written for the information of the flax-growers of this country, and more especially of Ireland. According to the description forwarded by Mr Rumbold, flax is grown universally throughout the whole of the northern part of Russia, its preparation being treated in two distinct ways. The first method, by steeping, is invariably adopted in the governments of Ostroff, Livonia, Esthonia, the greater part of Vitebsk, Wilna, and Kovno; and these produce almost the whole of the steeped flax for exportation. The process being strictly prohibited in rivers, it is customary to dig a number of square pits in low situations, where water will collect; and in these pits the flax is placed so soon as possible after it is pulled, and before it gets partially dried by sun or wind. Afterwards it is taken out of the water and spread thinly over grass fields, if possible, and there it remains until the fibre detaches itself from the straw; it is then taken and stacked till wanted for the subsequent processes.

The second mode, which is followed in the neighbourhood of Archangel, is more primitive. The flax is pulled, partially dried in a hanging or upright position, and then simply spread thinly on grass, until the fibre detaches itself from the stem or straw. By this means a smaller portion of long clean fibre remains ich going off in tow and codilla : the colour is ver bright, but mostly of a dull rusty hue. The mate and soil in all cases have much to do th the superiority ; certain spots produce oice flax every year, whereas a few miles in her direction, cultivated by the same people, oduce quite different goods, and it is rare, expt in certain parts of Esthonia, to see flax equal what is grown in Ireland.

The great extension of the flax trade of late ars in Russia may be attributed to the enorous rise in price, consequent upon the scarcity cotton from America. Prices of flax have tterly been to the peasant as much as three mes what they were fifteen years ago ; the easants, therefore, sowed every available acre ith flax. Tolerably well-worked arable lands nd willing tenants for the year at from 30 to 50 oubles per desiatone, equal to about 25s. to 45s. he acre. Many merchants and rich peasants re now buying up land and estates from the nobility and farmers, who have neither capital nor enterprize to make the land profitable.

In Belgium, the flax crop in 1856 covered 32,836 hectares, being two-thirds of the whole land under cultivation ; and there has been an increase of 9000 or 10,000 hectares, consequent upon the increased price. The system of steeping flax is much the same as was followed fifty years ago, either in meadows, or in stagnant or running waters. The two latter methods are preferred ; for as the fibre prepared in meadows is apt to become discoloured through the action of the soil, the former system is little practised, save in districts where water is scarce. The favourable results of the operations must be attributed in a great measure to the watchfulness and unremitting care of those employed, and to their discernment in seizing the proper moment for commencing or leaving off the process.

In Holland, flax is not grown indiscriminately throughout the country, its cultivation seeming to concentrate itself around two districts of limited extent, where the soil, and possibly the water, is particularly adapted to its growth or subsequent preparation for the market. The more important of the two is the southern district, comprising a portion of South Holland, Zealand, and North Brabant, all watered copiously by the large streams flowing from the valley of the Rhine; the other is the northern district of Friesland and North Holland. The growth and preparation of the flax form the almost exclusive occupation of the communities who are engaged therein. In the great southern district these communities, separated by the nature of their occupation, and by their insular position, from the rest of their fellow-countrymen, are distinguishable by their ignorance and the primitive nature of their manners, not less than by their general appearance. They are occupied during almost the whole of the year with the growth or manipulation of their favourite produce. The processes, which consist of steeping, washing, beating or bruising, and separating the different portions of the plant, are conducted in the cottages or gardens of the peasantry, who evince considerable jealousy if curiosity is shewn about their employment.

The water in which the flax has been soaked is poisonous, and is carefully avoided by both man and beast. The State, however, does not interfere in the matter, and perfect liberty is left to those most interested to adopt or neglect sanitary precautions. This arises mainly in consequence of the abundance of water and the size of the rivers ; but in the event of such an industry being introduced into Ireland, Mr Locock, in his report on the Netherlands, suggests that it would probably be necessary to enact regulations for limiting the noxious effects of the polluted water, by preventing its being thrown in too great volume into the streams and rivers of the country.

THE TURNIP BEETLE.

THE striped turnip beetle, or as it has been called, the turnip fly, earth flea beetle, black jack, &c., is named in Curtis's arrangement of British insects, Altica nemorum. The former word, derived from the Greek, alludes to the leaping powers of the genus, and the latter signifies that this species inhabits woods and groves, which were more especially its haunts before the cultivation of turnips became general. The economy of this little pest has puzzled the man of science, as well as the practical agriculturist, for many years ; and for want of that rigid care which is indispensable in the investigation of natural history, numerous errors have been adopted which have led to the promulgation of many false theories. The beetles are shining black, minutely punctured ; the head is rather small, with two prominent orbicular eyes, finely granulated ; the mouth projects a little, the upper lip and feelers visible ; just above the nose are placed two longish horns, each composed of eleven joints, the three next the head ochre-coloured, the first being the longest, the remainder dull black, the terminal one-pointed ; the thorax, or trunk, is broader than the head, narrowed a little before, with the sides rounded ; the two wing-cases are moveable, and in form oval ; they are twice as broad as the trunk, and four times as long ; each has a distinct ochre-coloured stripe, sometimes approaching to white, running down the centre, generally winding a little on the outside, near the middle, and curved inward at the extremity ; beneath are ample wings, twice as large as the body, and folded up for protection when unemployed ; the legs are of a rusty ochre, the thighs pitch-coloured, the hinder being very thick, and formed for leaping ; their tibiæ, or shanks, are also the stoutest, and thickly fringed on the outside towards the end ; the feet are all composed of four joints. The mouth is composed of six parts ; the upper lip is large, broader han long, and a little narrower before ; the anerior margin is slightly concave, and furnished with two short bristles. The mandibles, or teeth, form two sets, one placed on each side so as to meet ; they are strong, bony, and semilunate. ne maxillæ, or jaws, are two, placed on each de, beneath the teeth ; they are small, termin- ing in two lobes, densely fringed with fine hairs at the apex.

The length of the beetle varies from three-quarters to one and a-quarter of a line ; the line being the twelfth part of an inch. The longer ones are females, which are considerably stouter than the males, and this is especially the case after impregnation. When the beetle is feeding, the different parts of the mouth are all employed —the upper and under lips open to liberate the other organs ; the two sets of teeth, or the toothed mandibles, as they are named, meet when closed, and from their strength and action, they readily break the enticle of the leaf.

The turnip beetle, and all the species of alticæ related to it, are readily known by the great thickness of the hinder thighs, which gives them the power of leaping, like fleas, to a prodigious distance, considering their small size. 18 inches is about the greatest extent of their leap, which, in a straight line, would be, averaging their stature, 216 times their own length. This little plague is not confined to our own island, for it is abundant in Germany, and common everywhere in Sweden, where it is very destructive in its perfect state. The turnip beetles hybernate, or live through the winter in a torpid state, and may be found under the bark of trees, as well as beneath fallen leaves, in the chinks of old paling, the stumps of thorns and of other bushes, and the hollow stalks of grass and stubble. But, inactive as they then are, the warmth of the hand is sufficient to revive them in a few minutes, so that an unusually mild day in January or March will partially seduce them from their retreats.

On the first indication of spring, if the weather prove fine, they arouse from their slumbers, and permanently leave their winter quarters for sunny situations, where they may be seen sitting on walls in considerable numbers, or sunning themselves on dry banks or clods of earth. They have been observed in gardens on turnips and cabbage plants as early as March, and in April on the crops in the fields ; but May and June appear to be the more usual periods of their first and most fatal attacks.

The next subject to be considered is a remedy against the attacks of the turnip beetle, which in some years cause losses amounting to an enormous sum of money. Now, with regard to the eggs, they are laid on the under side of the rough leaf, where they are pretty well secured from rain, and also protected by the strong and ing ribs that support the leaf from any that might occur from the leaves being by the wind, or other casualties; and the · skin being the most delicate, is best d for the entry of the infant and tender ts into the substance of the leaf. It is not, re, in this stage that much can be done roying them. The maggots, it is evident, on the rough leaf, and do little or no mis- ɔ the growth of the plants; it is in its last erfect state that the mischief is done. It beetle which destroys the two first smooth called the cotyledons, and the heart of ınt between them, by piercing them like a lestroying the cellular tissue, and stopping owth of the plant. They also feed upon leaves, drilling them full of round holes, are larger on the upper than the under the leaf; and if the appetite of the beetle t satisfied, he enlarges the aperture, and ives it an irregular form, which dilates with owth of the leaf. It is at this stage of their ace, if at all, that we can attack them with st chance of success.

:ollecting the turnip beetles by sweeping arious methods, large numbers of small orous beetles, belonging to the Carebidæ taphylinidæ, are found with them. These bly feed on the larvæ; but, from the very : discovery of the early stages of the turnip , we are yet ignorant of the parasites, of . it may be presumed there are more than species that prey upon the maggots and alides. It is a wise dispensation of Pro- ce to keep every animal in check by some that is either more powerful or more sa- us than itself; and this counteracting effect oduced by a degree equal, eventually su- · to the noxious animal, so that in a greater s space of time the destructive power may ndered no longer formidable.

the turnip, when in rough leaf, is not in any :r from the attacks of the beetle, it is evi- that our first care must be to preserve the ; plants, and this can only be done by the ration of the soil, or using such speedy s the instant the beetles appear, as will oy or drive them away. The primary ob- ; to discover the best manure for that pur- and a dressing that will render, if possible, oil obnoxious to the insect. It has been :tly said that the manure which most effec- promotes the growth of the plant will be est defence from the insect; and that when owth is slowest, the danger from the insect st serious.

Burning has been found the best preventive against the beetle by some, which is readily accounted for, since it would destroy all chrysalide in the land; and as the beetles may be in abundance in the field when it is preparing for turnips, burning would of course be destructive to them, and spreading the ashes afterwards over the ground will prove an additional security; but such a system does not suit sandy soils, neither can it be followed up regularly on any land. Feeding off the turnips is strongly recommended by some farmers as an antidote to the beetle, as well as from its peculiar advantages of manuring and preparing the land for the barley crop and succeeding seeds. Others, again, advise drilling in not less than from 3 lb. to 4 lb. of seed to the acre, and 6 lb. to 8 lb. broadcast, observing that thick sowing causes the plants to grow much more rapidly when young than thin sowing, and by drilling in with the seed a peculiar compost, containing the strongest animal manures, the fly, observes Mr Linton, in the *Journal* of the Royal Agricultural Society, has never disappointed him of obtaining a good crop. Mr Curtis thinks it probable that the ammonia in manure may be disagreeable, if not destructive, to the insect; and the rapid growth of the plant, from its stimulating effects, is one of the best securities against the attacks of its enemies.

With regard to the use of lime, a great deal must depend upon the soil upon which it is used, which may account for the conflicting opinions respecting its effects in protecting the turnip from the fly. From 6 to 8 bushels of quicklime per acre may be sown over the young plants successfully in dry weather; but this, as well as soot, requires to be regularly and evenly dusted over the plants. Another authority suggests the lime should be applied when the plants are wet with dew. But there is great variance of opinion as to the results of these experiments.

It is certain that manure gives strength to the turnip plant, but it is doubtful if it will destroy the beetles. Hoeing and rolling may harass and kill many of them, and as this process promotes the more rapid growth of the plants, it must be attended with no small advantage. There are many who consider that turnips should be sown immediately after ploughing, and that much of the success attending a crop depends upon the diligence employed in getting in the manure and seed; whilst some maintain that the land should be undisturbed for a fortnight before sowing.

Among the Tombs.

DO not be afraid, gentle readers, for ghosts. Although we have written the word tombs, we had no idea when doing so of being near the grave. The thought of "Hervey's Meditations" were among the last in our head when we jotted down the title of this article, although we have often read them over with pleasure (if such a word can be appropriate in relation to such a book, and under such serious circumstances), sitting upon the tombstones of the great departed. We have read and meditated upon them beside Gray's Monument, who wrote—what all people in the agricultural "line," to use a commercial phrase, can readily understand—his "Elegy," which, if we remember rightly, forms also a portion of his epitaph. It commences agriculturally, and therefore very appropriately quotable here.

The curfew tolls the knell of parting day,
The lowing herd winds slowly o'er the lea,
The ploughman homeward plods his weary way,
And leaves the world to darkness and to me.

As this is a discursive article, we do not hold ourselves bound to the *ipsissima verba* of this quotation, more particularly that the skill of the poet was so great that schoolboys, we believe, can transmogrify the third line written into nearly a score of different shapes, at the same time that they preserve both the meaning and the rhythm.

We have studied "Hervey's Meditations" also in the Necropolis of Glasgow, beside the Jewish portion of the cemetery—surely one of the most melancholy places that man or angel could visit. Yet, beyond conception almost an interesting place to all who consider their latter end. On the gate which gives admission to the last resting-place of the Jewish race in Glasgow, indelibly stamped out in iron, are the words of the Scotch paraphrase :

Naked as from the earth we came,
And entered life at first,
Naked we to the earth return,
And mix with kindred dust.

And above that gate there is a verse c
in stone which we have often paused to
although it was "familiar in our mout
household words." And we have r
with all the more interest recently, be
the one who wrote the lines, although i
tomb himself, has been grossly mal
Need we mention the name of Byron?
says in that Hebrew melody, whic
Glasgow Jews have selected :—

"Tribes of the wandering feet and weary br
When shall ye flee away and be at rest?
The wild dove has its nest, the fox its cav
Mankind their country, Israel but the gra

But we are forgetting ourselves altog
What we meant at the beginning was
not tombs; but as we purpose being
rectionists, perhaps the spelling at the
of the article is, after all, not so inappro
Under this heading we intend to quote
kind of intermittent way, it may be-
some of the old authors on rural m
That we may somewhat relieve the g
if not heaviness, of this long prelir
"palaver," as Mr Carlyle would say, w
our first exhumation from "Daniel's
Sports."

FRANKLIN AND THE FISHERS.

The late Dr Franklin observed, that of
amusements which the ingenuity of man had d
none required the exercise of patience so m
angling, and he enforced his remark by reciti
following :—That setting out from Philadelp
six o'clock on a summer's morning, to go abou
miles, he passed a brook where a gentlem
angling. He inquired what sport, and was told
"but," added the gentleman, "I have been h
two hours." The Doctor continued his journ
on his return in the evening, found the angler
same spot, and repeated his inquiry. "Ver

was the reply. The query was naturally re- by asking how many fish he had caught? at all," answered the gentleman, "but about lle of the day I had *a most glorious nibble.*"

ORTY YEARS WITHOUT A NIBBLE.

ie Doctor's anecdote, that of the river Lea may be added—This person being daily seen articular spot, a brother angler conceived it the resort of abundance of fish, and there, rning at day-break, began his operations. al attendant of the place arrived some hours id threw in his line; a long silence ensued, e first comer remarked, that he was out of not having caught any fish in this favourite iich, says he, "I am convinced it is with you, constant attention I have seen you pay to it." replies the gentleman, "I confess long custom lered me extremely partial to the spot; but as ish, I assure you, that here have I angled for rs, and never had a bite yet."

WHITE PARTRIDGES.

96, at South Cave, Mr Barnard's, near Marghton, was a covey of eight partridges; four were the most beautiful clear white, three ed; the eighth bird escaped from under the which the other seven were secured. They pt alive in the mew, and considered as great es.

e any of our readers seen any of these ulate birds. If so, we should be glad e an account of them, as the author hich we have quoted seemed rather d to "draw the long bow," or at least pt without questioning the length of the others.

next extract, from Mr Robertson's culture," shews what kind and quality ep existed in Mid-Lothian three-quar- a century ago, and also the number ices of horses.

SHEEP.

being a great proportion of hill and moor in inty, several flocks of sheep are accordingly it even these are not all natives, many being in from year to year, generally from Tweed- These are a small coarse woolled kind, the ldom worth a shilling, and the carcase rarely g 12 lb. a quarter. In the lower parts of the a better kind on some farms has however been ed, principally of the Cheviot breed; in some ossed with the Herefords, in others with the ll species. These last, in particular, seem of cultivation, as, besides giving a fleece of at ir times the value of the blackfaced moorlanders, and rising from 15 to 25 lb. a quarter, they are now known to agree very well both with the climate and the soil. It is believed by intelligent people, that a much finer breed may be introduced with advantage on the greater part of the high-lying pastures of this county. Gala Water, in particular, abounds in sheep walks, little inferior, if at all, to the hills of Teviotdale. The present stock there, however healthy and valuable as moorland sheep, are far below the worth of the Cheviot flocks.

HORSES.

There may be about 5000 horses used here for the purposes of husbandry. Of these, not one-half are of our own rearing, but have been purchased from the shires of Linlithgow and Lanark. There may be about 600 required yearly to recruit this stock, of which, till very lately, two-thirds were bought at an annual expense of at least £6000 to the farmers here, which chiefly went into the pockets of the Clydesdale breeders. This, however, is but a small proportion of their sale; for, besides some which go to the north of England, there is from many counties in Scotland a constant demand for the draught horses of Lanarkshire; a durable active breed, esteemed among the best of the species in the island.

Since 1784 the price of horses has rapidly advanced. The prime sizes, 16 hands and upwards of height, which at that time sold for £18 or £20, have gone as high as £30 or £35. The smaller kinds, from 14½ to 15½ hands, which include most of the plough horses, have not been so much sought after, so that their price has only risen from £12 or £14 to £18 or £20. On the whole, the prices seem to have risen to the level of the Mid-Lothian rents, from which most of the farmers now endeavour to breed as many as will at least supply themselves, and may probably be able, in a few years, to rear some for the carriage and the saddle, for both of which there is such a constant demand in Edinburgh. Besides, from that spirit of emulation which at first accompanies any general undertaking, it may be hoped that the breed itself will be improved, and become of more intrinsic value, even although the price should fall, which it has indeed of late done, to the amount of 20 per cent.

In regard to the question as to the comparative use of horses and oxen in husbandry, it seems to be very generally understood here, that horses are preferable, from being possessed of more active qualities, which enables the husbandmen, with them, to push forward their operations at a throng time, with a celerity that could never be attained with oxen. That these last are naturally fitted for the stall by the time they become unfit for labour (the strongest argument in favour of using them), is of less importance in this county, in which cattle feeding, as yet, forms but a small part of the business of a farmer.

The following extract gives us an insight into

THE MANNERS, MODE OF LIVING, AND SUPERSTITIONS OF FARM-SERVANTS.

A decent orderly behaviour is maintained by the country servants. The Sabbath with them is truly a day of devotion. No weather, almost, can keep them from church, clothed in their best array, which, considering their wages, is wonderfully good. During the remainder of the day they keep themselves at home, reading their Bibles, or, in many instances, they join together in family worship. The frequenting of taverns on Sunday is *almost unheard of* among them ; hence, instead of that langour and sickness which prevents many a poor mechanic from earning his Monday's wages, that day, on the contrary, to the farmer is the most profitable, his servants working with more alacrity and vigour than on any other of the week. They have always, besides, been laudably ambitious of giving their children a decent education, and would be ashamed if they could not at least read the English language. School fees are indeed here extremely moderate. Reading is taught for 1s. 4d. the quarter ; writing and arithmetic (in which the children of labourers are in many instances instructed), at 2s. 6d. As the whole labourers employed in husbandry remain, with few exceptions, attached to the national church, much of this decent and virtuous disposition may be attributed to the attention of the established clergy, who, not satisfied with merely delivering from the pulpit the pure principles of Christianity, of which their own lives are exemplary patterns, are also at much pains, by frequent private visitation, to see that a proper regard to their spiritual instruction is observed. A few remains, however, of popular superstitions are still to be traced ; but these are on the point of being extinguished altogether. *Witches* and *fairies* have wholly disappeared ; the *dead-knock* is now heard only by a few old women, who get very little credit from the discovery ; while *Spunkie* (Will 'o the Wisp) is almost banished from the country for want of bogs and swamps wherein to exert his influence. The point in which the country people seem most credulous, is believing implicitly whatever is *printed ;* and yet it is astonishing how little credit they give to the writings of that Jack-a-lantern Paine, and his bewildered followers. Even Lord George Gordon was very little respected among them, although he had the appearance of supporting the cause of religion, which has always been a favourite topic with the commonality in this country ; but even in this, as well as in points of political speculation, they are far exceeded in zeal by enlightened weavers, and other philosophical tradesmen and mechanics.

They still, however, retain a great predilection for the customs of antiquities, particularly on the occasion of a marriage or christening ; at which the entertainment provided, and the various ceremonies observed, are conducted on a regular system of *etiquette*. Thus, at their marriages in particular, they have not only a *best-man* and *best-maid*, but even *a master of ceremonies* (*Master Household*, as he is called), whose business it is to see that the company be properly arra at dinner, &c., and who is commonly some face tailor, as a good deal depends on the humorous d sition of this office-bearer ; which, while they the convivial spirit of the present race of the ranks, are perhaps representations of the a practice of those in a more elevated station. Th names of *Marshal*, *Moubray*, *Umphraville*, *Bisset*, once pertaining to antient Barons fallen into deca still very general among the lower orders here. knows but these very people may be the descen of those illustrious families? It is at least ascert that the lineal representative of the great Mout Dukes of Norfolk, is now a common labourer i neighbourhood of Queensferry, not far from Edinb At their marriages they often meet with a libera tribution from those who attend. Of all our a customs, none has maintained its ground so w this practice of making *Penny weddings*, as th called, for the behoof of the country servants ; as cords not only with a very proper regard towards but with the jovial inclination of the people in ge who enter into all the spirit of hilarity and merr which arises from the occasion, still further inspi the music and the dance which accompanies the tainment. Proprietors, as well as farmers, tak method of promoting matrimony, which generally £10 or £12 very seasonably to the new-wedded From this, also, they are induced to behave w fore marriage ; while a bad servant meets with a contribution, a good one has been known to make

Their cottages are now constructed in a bette than formerly ; they are larger, better lighted also warmer. Adjoining to these they have monly a piece of ground, of two or three fa square yards each) inclosed for raising pot-herbs of them have a few poultry, the produce of brings them a good price in Edinburgh market.

The furniture consists, in general, of two beds, chairs or stools, table, chest of drawers, clothes &c., and they are all ambitious of having a time- if it were only a cuckoo-clock. The whole n worth from £10 to £12. Their clothing parta the improvement which has taken place in the rent branches of that manufacture, being for th part bought in Edinburgh, where is to be had variety of stuff suitable to their circumstances, and strong, also decent and becoming. In thei day's dress they make a very good appearanc even pay attention to the fashion. The Sunday's of a young ploughman consists generally of a c blue cloth, at 5s. 6d. the yard ; velvet vest, co breeches, white cotton stockings, calf-skin shoe black silk shoe-knots, shirt with ruffles at the and a white muslin fringed cravat, and a hat 8s. or 10s. The shoe-knots and ruffles are, i rather uncommon, but all the other articles a much in use. The old men still retain the *blue b* especially when they are in full dress. In the lands, where some old farmers still use this a

:, they wear a *black* bonnet, to distinguish m their servants. ir food they still live in much the same simple ıeir forefathers. Oatmeal forms the basis or part of their sustenance. They have it regu breakfast and to supper, made into pottage, ıey eat with a small allowance of buttermilk. :r they eat it in bread, in addition to their *kail;* f soup made of barley broth, intermixed with nd other pot-herbs. To this they add at times , and fish of different kinds; seldom wheat nd still more rarely butcher meat. This mode in which, although with no great variety, there s abundance of food, seems to be very con- : to the natural constitution of the people, as found to go through their labour without feel- nselves fatigued, and enjoy a state of health very seldom interrupted. At an average, they ıbove two days sick in a year.

n Professor Thorold Rogers' valuable .pon agricultural prices, we take the fol- with regard to

FARM ACCOUNTS.

r the largest number of farm accounts which :en examined are preserved in the Public Office. It is seldom, however, that the docu- lerived from any particular estate are very ıs or very consecutive. It is not clear how cords came into the possession of the Crown. ıay have been transferred from the mesne lord occurrence of escheat or forfeiture, or may en surrendered on the occasion of a re-grant of Some, perhaps, represent the proceeds of administered in the Court of Wards. A few uch estates as, belonging to lunatics, were in tody of the Crown. Accounts of monastic vere probably transferred, either on the sup- of alien priories, or at the general destruction establishments in the sixteenth century. A records of estates held by the king or queen, vere audited in the same way as the estates of ›rds. Some of the evidence of these royal ıas been extracted from what are called the ıccounts in the Pipe Rolls. . . . .

accounts are, as a rule, in a far more dilapi- ondition than any other antient documents. :rest they embodied was transitory, and there › have been no motive to preserve them, other e value annexed to all evidence of title. In ıt suit carried on some years since between ›llege and the tithe-payers of Hornchurch, re- vas placed by the plaintiffs on the evidence of iliff's accounts in the fourteenth century. It is : that we owe the preservation of these records ›arbarous rule of law which denied a prescrip- : to land and its incidents, in case proof could of an adverse right within the time of legal

FIRST SPECIMEN OF ENGLISH PAPER.

The earliest English specimen of paper made from linen rags which I have ever seen, is a small piece containing an account for spices supplied to the College larder in the year 1337. The fabric is very coarse and rude, a large fragment of the original linen being still visible in the substance of the paper, and the texture is very loose. Shortly after this date, however, excellent paper, wired and watermarked, may be found; but the antient fragment alluded to above, is perhaps the earliest existing specimen of an art which has been the means of such important benefits to mankind. After the use of paper became general, the quality of the parchment is greatly deteriorated.

From Daniel's "Rural Sports" we extract the following in reference to the

FASCINATION OF FISHING.

Such singular fascination had this fishing in one instance, that a clergyman, minister of *Thames Ditton*, who was engaged to be married to a daughter of the then *Bishop of London*, overstaid the *canonical* hour, and the lady, justly offended at his neglect, withdrew her assent; he, however, certainly proved himself an exception to the poet's remark—

> "What gudgeons are we men,
> Every woman's easy prey."

From the same genial authority we glean the following anecdote as to

CLERICAL LOVE FOR COURSING.

A fondness for *coursing*, similar to that of the above gentleman for *angling*, seemed to have operated upon a Gloucestershire Justice, who, attending the funeral of his wife, arrayed in all the pomp of woe, and seemingly torpid with sorrow, was suddenly roused from his grief by the starting of a *hare*, upon which, as if forgetting the melancholy business he was about, he immediately threw down his *black cloak* and other encumbrances, and *hallooing* on a brace of greyhounds, the constant attendants of all his steps, pursued the game. The hare being killed, he rejoined the procession, which had halted on the occasion, and the bearers had set down the corpse. Come, gentlemen, said he, resuming his melancholy tone, with his *sable* vestments, in the name of God, let us proceed with the remains of my dearest wife, and finish the ceremony for which we are met.

The clever author of the "Gentleman Farmer," published in 1788, thus writes upon the

ADVANTAGES AND PLEASURES OF AGRICULTURE.

In the view of profit, agriculture is fit for every man. In the view of pleasure, it is of all occupations the best adapted to gentlemen in a private station. Matter crowds upon me, and I am at a loss where to begin. Agriculture corresponds to that degree of exercise which is the best preservative of health. It requires no hurtful fatigue, on the one hand, nor indulges, on the other, indolence, still more hurtful. During a throng of work, the diligent farmer will sometimes be early and late in the field; but this is no hardship upon an active spirit. At other times, a gentleman who conducts his affairs properly may have hours every day to bestow on reading, on his family, on his friends.

Agriculture is equally salutary to the mind. In the management of a farm, constant attention is required to the soil, to the season, and to different operations. A gentleman thus occupied becomes daily made active, and is daily gathering knowledge; as his mind is never suffered to languish, he is secure against the disease of low spirits.

But what I chiefly insist on is, that, laying aside irregular appetites and ambitious views, agriculture is of all occupations the most consonant to our nature; and the most productive of contentment, the sweetest sort of happiness. In the first place, it requires that moderate degree of exercise, which corresponds the most to the ordinary succession of our perceptions. Fox-hunting produces a succession too rapid; angling produces a succession too slow. Agriculture corresponds not only more to the ordinary succession, but has the following signal property, that a farmer can direct his operations with that degree of quickness and variety which is agreeable to his own train of perceptions. In the next place, to every occupation that can give a lasting relish, hope and fear are essential. A fowler has little enjoyment in his gun who misses frequently; and he loses all enjoyment when every shot is death: a poacher, so dexterous, may have pleasure in the profit, but none in the art. The hopes and fears that attend agriculture keep the mind always awake and in an enlivening degree of agitation. Hope never approaches certainty so near as to produce security, nor is fear ever so great as to create deep anxiety and distress. Hence it is that a gentleman farmer tolerably skilful, never tires of his work, but is as keen the last moment as the first. Can any other employment compare with farming in that respect? In the third place, no other occupation rivals agriculture in connecting private interest with that of the public. How pleasing to think, that every step a man makes for his own good promotes that of his country! Even where the balance happens to turn against the farmer, he has still the comfort that his country profits by him. Every gentleman farmer must of course be a patriot; for patriotism, like other virtues, is improved and fortified by exercise. In fact, if there be any remaining patriotism in a nation, it is found among that class of men.

A gentleman farmer who is disposed to embellish his fields, has a great advantage over others. He can execute that pleasing work at the cheapest rate, by employing upon it his farm-servants and cattle, every vacant hour. This slow method is indeed ill suited to the ardour of an Indian Nabob impatient for enjoyment. But is not the advantage clearly on the side of the farmer? The refined pleasure of embellishments
from a slow progress, which affords leisure to
the eye upon every new production.

HUNTERS AND FARMERS COMPARED.

Mr Freeman will be glad to learn, i
does not already know, that he is suppo
in his ideas about what he calls the cruel
hunting by so eminent a man as Lord Kai
the author of the volume from which we
already quoted. In Lord Kaime's day,
ever, it would appear that farmers' duties
enjoyments were different from what the
now, when they can combine the work o
farm with the enjoyment of a day in the

In former times, hunting was the only busines
gentleman. The practice of blood made him
and hard-hearted: he led the life of a
or of a savage; violently active in the field, su
indolent at home. His train of ideas was confir
dogs, horses, hares, foxes. Not a rational idea e
the train, not a spark of patriotism, nothing do
the public, his dependents enslaved and not f
husbandry, no embellishment, loathsome weeds
his dwelling, disorder and dirt within. Consid
present mode of living. How delightful the
from the hunter to the farmer, from the destro
animals to the feeder of men! Our gent
who live in the country, have become activ
industrious. They embellish their fields, in
their lands, and give bread to thousands. Eve
day promotes health and spirits; and every ne
brings variety of enjoyment. They are happy at
and they wish happiness to all.

How strange it seems to read about
proposed canal from Edinburgh to C
dale." Yet this we find in a "general
of the agriculture in the county of
Lothian," published in 1795, by "G
Robertson, farmer, Granton," a farm
even now is celebrated through the
which the present farmer, Mr M'Do
grows. How astonished would Mr R
son be could he be resuscitated, as his
to see coal, limestone, and iron carri
the rate of forty miles an hour, not by
but by rail. Mr Robertson says:—

The proposed canal from Edinburgh to Clyd
should it be carried into execution, will be
mense advantage to both the counties of Lana
Mid-Lothian, not only as opening an easy me
conveyance for the different products at present
country, but also from the vast quantity of coal
stone, limestone, &c., that may be procured fro
lands adjacent to the proposed tract, and whi

nt locked up merely for want of such a mode
ıge.

m the same author we extract the fol-
;, which shews the

[PETITION FOR FARMS 75 YEARS AGO

'e been as keen as it is at the present
ı Mid-Lothian :—

ıs already been taken notice of that the compe-
ɔr farms in the vicinity of Edinburgh is so great
:duce the profits of the husbandman to little
ıan legal interest on his capital; of course, a
so circumstanced must be very liable to failure
ıny disastrous occurrence, particularly as in
:ases that happen when the laird,·or factor, with
ıting disposition, exacts rigorously the rent at
cise term of payment, giving no more indul-
to the tenant on a *racked* rent than to others
joy their farms on more favourable conditions.
ry unfavourable circumstances to the tenant arise
ıis harshness of conduct; first, he is under the
.al necessity of forcing his crop at all times to
, whether it can be done to advantage or not,
ıs often obliged to sell it at an under value for
ash to people who, knowing his situation, take
ıge of his necessities; second (which is perhaps
he dares not lay out money upon the improve-
r melioration of his farm (which is always a
and often an uncertain speculation, but which
·theless essential to the well-doing of the far-
ecause he has no certainty that the money so
may not be required, before he can recover it,
fy the demands of his rigorous landlord. I
:quently had occasion to observe the circum-
attending failure among farmers, and have
:en it imputable to the above rigorous, and at
ıe time injudicious, conduct on the part of the
:ors.

PITAL EMPLOYED IN AGRICULTURE.

was formerly stated at £5 the Scotch acre in
country; £2 in the moorlands, and 5s. on the
ıd was considered by some of the most intelli-
mers as a very proper calculation at the time.
:cumstances, however, on which this in a great
depends, have had an effect, even in the short
ıt has intervened, to render this computation
; the one is the higher rate at which every
required for the stocking of a farm is now
independent of its intrinsic worth; and the
he intrinsic value itself, is augmented from the
taste that more and more prevails, of having
.ing of a superior quality to what people were
r satisfied with. From both these causes in
:ion, the capital must now be stated as being
4th part more than it was at the former period,
o years ago. The estimate already given of
tal on a single farm in the vicinity of Edin-
ıeing £6, 5s. 3d. the Scotch acre, corresponds pretty nearly with this idea; and as to that calculation, it is hazarded in the full conviction, not only of its being moderate, but that in every point wherein it is extravagant, I will not only deserve, but will meet with censure; of course, I may be considered as having guarded as much as possible against that imputation.

On these data, the whole capital employed in agriculture, in Mid-Lothian, may be stated as under:—

	Scotch Acres.		Per Acre.			Amount.
			£	s.	d.	£
In the low country	60,000	at	6	5	0	375,000
moorlands	60,000		2	10	0	150,000
hills .	60,000		0	6	3	18,750
Total acres...	180,000	av.	£3	0	5	£543,750

The following spirited remarks we call up from the vasty deep of the *Farmers' Magazine*. The date is 1813, and the signature to the article "Atlanticus." It shews

HIGHLANDERS' PROGNOSTICATIONS OF THE SEASONS,

and it introduces some words which, for their novelty, are interesting on this side of the Tweed.

Our Highland forefathers, though rude in science, were shrewd observers of the phenomena of Nature which came beneath their view, and they have left us many important lessons, couched in proverbial expressions, which, in these days of affected learning and refinement, are not so much attended to as they deserve. The first refers to the probable weather of the following spring, and is as follows, viz. :—

> "B'fhearr a' chreach a thighinn do 'n tir,
> Na Faoiltich mhin an earraich fhuair."

Which being translated—

> "Better a plundering foe to sweep the land,
> Than the mild *Gandies* of a cold spring."

The *Gandies* form a period of four weeks, being the two last of winter and the two first of spring (O. S.); or, they comprehend the two last days of January and the first twenty-six of February (N. S.). And the object of the proverb is to suggest that when these days are particularly mild, the rest of the spring, or rather what in the Highlands is termed exclusively *the spring*, will be tremendously severe—more destructive to the country than the desolating progress of a plundering enemy. That this remark should hold good in every instance is certainly not to be expected or supposed; but had Highlanders attended to it last season, there is no doubt that much of the evil which actually happened might have been prevented. Never were milder *Gandies* known in the memory of man. Now, had Highlanders improved the sagacious observation of their fathers, and husbanded their winter keep for the prognosticated storms, their cattle might probably have been preserved. But, instead of this, presuming upon the favourable commencement of the season, as if the summer had already arrived, they imprudently squandered their little provender with the most unwarrantable profusion. Some sold their supposed overplus of straw; some took in additional winterers to consume it; and some gave more to their own cattle than necessity demanded. The consequence was, that when the storm set in on the 12th of March, there was very little provender remaining; the cattle were for some time preserved in existence by the food of man; and when no more of that could be afforded, they died in scores.

The next Highland observation which I shall notice respects the probable weather of harvest. It is—

"Reotha an t-sil-chuir, uisg' an fhoghair."

i.e.—

"For every day of frost in spring, there will be a day of rain in harvest."

This, too, has been fully verified in the last season, and should make Highlanders not to wait the over-ripening of their corn after a very stormy spring, but to embrace every favourable moment to cut down and secure their crop.

A third observation, evidently founded in truth, inculcates the necessity of seasonable sowing. It is—

"Seachdan do earrach ceithir-la-deug do fhoghair.'

"A week in spring makes a fortnight in harvest."

This should never be forgotten; yet is almost universally disregarded by Highlanders.

The last of these Gaelic sayings with which I shall trouble you at present refers to the probable character and result of the winter season, including the spring, viz:—

"Tri la do dhoir-cannan dubh ann an toiseach a gheamhraidh; ge b'e bheireadh dul de na chroth cha b'e mis ach an dthigeadh an samhradh."

Literally—

"If the three first days of winter (o. s.) are dark and open, though stormy, I shall not despair of the cows till the return of summer."

Solomon said there was nothing new under the sun, and in digging among the *tomes* one finds more and more, the deeper and the farther he goes down, that the words of the wise king are true. Take for instance the following, which we extract from the *Museum Rusticum*, of a date more than one hundred years ago, written from a correspondent in the Isle of Ely:—

METHOD OF STABBING HOVED CATTLE, WITH CAUTIONS ON THE SUBJECT.

Some few years ago a neighbour of mine had a bullock under the distemper, and never seeing anything of the kind before, he came to me for my advice. The ox was so bad and blown up he could not stand. I had somewhere read of this operation, but had never seen it performed. However, upon this occasion, seeing the absolute necessity for some kind of relief, I turned operator myself.

I took a sharp-pointed penknife, and fixing my eye on the most prominent part of his belly, thrust the blade through the integuments quite into the abdomen. There issued out a great gust of wind, very fetid, with some water of a reddish colour. The bullock seemed easier, but far from well, for the wound presently closed up, and admitted no more air to escape; so that I was under the necessity of stabbing him twice more, in different parts of the belly, before he was thoroughly relieved, which, by the help of a glyster after the last stab, was presently brought about; and here give me leave, gentlemen, before I leave this subject, to give a few cautions to those who may be under the necessity, one time or other, of performing this very useful operation. Reflection and experience warrant me in them, therefore I shall freely proceed.

First, then, if it be performed with a penknife, not to be fearful in pushing in the blade a proper length, till you find wind issue out; for if the wind be in the cavity of the belly, you cannot possibly hurt the gut, the whole body of the wind being between you and it, which no reasonable bladed penknife can touch; and if the wind should be pent up in the intestine, you must penetrate it before the beast can be relieved. To this last perhaps it may be objected, that we run the hazard of killing the beast by wounding the gut; but I am far from thinking so, as I have seen many wounds of the intestine, both in man and beast, very happily cured. Yet granting there might be some danger in it, still we are certain, if the poor beast can get no relief, it must die; and so circumstanced, surely, gentlemen, a doubtful remedy is better than none at all.

Another caution is, that where these wounds are made in the belly with a proper penknife, it is not advisable to have them sewn up; for where there is a continual motion or action, as there is in the muscles of the belly and parts adjacent, such a practice is not only unwarrantable, but cruel; and why should we not behave with humanity to the brute species as well as any other?

My last caution and advice is, that upon all these occasions, when the beast is relieved of his wind, a proper glyster should be thrown on immediately as hot as he can bear it; these glysters strangely relieve them, by acting as a warm, comforting bath to their distempered bowels, and emptying the same of the load of muck within them. I have more to say on this subject, which I doubt not in the least will meet with general approbation, as it entirely tends to make this operation safe and easy; but unexpected company prevents me communicating it to you at present.

CAUTION RESPECTING THE MANAGEMENT OF LAMBS IN SNOWY WEATHER.

I have often heard it said, that we should profit by

unes. This I have frequently done, par-
the occasion I am about to mention.

a young farmer, and of course have been,
perience, led into many mistakes.

ars ago I bought five score lambs, with an
ep them for store sheep. I turned them
ls, where they did very well till the weather
o be snowy.

as the snow had covered the ground, I
e alarmed, lest my lambs should be starved,
ingly ordered one of my men to carry some
and lay it in different parts of the field for
t ; but in this I did very wrong ; for the
ot yet so deep but that the lambs could,
with their feet, clear it away, and get at a
This made them refuse the hay, to which they
aste ; and as more snow afterwards fell, I
ar no less than thirty-eight lambs by down-
er, and the rest were with great difficulty
I was obliged to try many methods of
em to eat the hay.

a little twisted hay across their mouths ;
ough a common method, had very little
hen rubbed some hay till it was soft and
ing it into their mouths, and holding them
is, indeed, taught a few to eat it, but not
t last I was obliged to buy half a score old
which I paid a good price, and turn them
t my lambs. As the sheep ate the hay fast
e lambs soon followed the example, and
ans I saved above half my stock.

caution was the occasion of my loss ; for
the lambs without giving them any hay
ow had been deep, and they had been
ith hunger, they would have taken readily
eating of hay.

loss was considerable, it dwelt on my
nd I took care never to make the like mis-
; in consequence of which care I have
ate years met with success in the lambs I
bought.

dred years ago, or at all events with-
of that time, there was a minister
, Adam Dickson by name, who wrote
tise upon Agriculture." From that
extract the following, which, at the
lay, will be read with something of
kind of feeling as that with which
g villagers regarded Rip Van Winkle
turn from Sleepy Hollow :—

E FREQUENT FALLOWING OF CROPS.

perhaps be thought surprising that when
rmers are prevailed upon to fallow regu-
in five years, that even more frequent fallow-
is should be proposed to them. And in-
gh the good effects of fallowing are so ob-
encourage the farmer to carry it further, yet I should scarcely have had the boldness to propose it, was I not supported by the practice of other nations, and particularly by that of the Romans.

That this was actually a practice among that wise and learned people is evident from many passages in their rustic writers.

Varro says that land should rest every other year, or, after a severe crop, carry one that in a lesser degree exhausts the land.

Columella says that wheat requires rich land, and that which carries a crop, and rests, and is well ploughed alternately.

Virgil requires that the fallowed lands, after they have carried a crop, shall be again fallowed.

And Pliny says, that this direction given by Virgil, is most proper when the extent of the farm allows it; but that if the situation of the farm does not allow this, then wheat may be sown after such crops as meliorate the soil.

This kind of land that was so frequently fallowed, was seldom dunged. The fallowing was considered as serving in some measure in the place of dung.

Cato, in directing how the dung is to be applied, requires it to be divided into four parts; one half to be carried to those parts of the corn fields where it is proposed to raise the crops intended for fodder, a fourth to be applied to the olive-trees, and the remaining fourth to the meadows. He does not suppose that any of it is applied to the corn.

When Columella treats of dunging land, he mentions nothing but the poor land; that kind that is not ploughed for the first time, till the end of August or the beginning of September. He gives the land that is to be dunged the same name with this land; but to put it past all doubt that it is this kind he means, he directs that it be dunged before it receives the second ploughing, and that the dung be laid on in September.

Virgil gives directions about dunging, but the land which he directs to be dunged is land exhausted by particular crops, which he mentions. These hurtful crops are likewise mentioned by Columella, and he proposes that after carrying them the land shall be dunged.

Pliny, though he supposes that dung may very properly be applied to every kind of crop, yet he mentions several kinds to which it is necessary, and wheat is not in the number.

From all these things it appears that the rich land, when fallowed for wheat, was very seldom dunged. And indeed they considered fallowing as supplying the place of dung. As an evidence of this, Columella, when directing how to prepare land for a particular crop, advises that it be dunged if it had carried a crop in the year immediately preceding; and when mentioning the injuries done by a crop, proposes that they shall be repaired either by fallowing or dunging. This practice of the Romans should certainly have some influence upon us, and engage us to fallow more frequently than we do.

When more frequent fallowings are here recommended, it is supposed that dung is to be applied as found convenient; but they are chiefly recommended from this principle, that they will produce tolerable crops without dung. If the farmer cannot be prevailed upon to lose a crop for every fallow when they return so frequently, he may order matters so as to take a crop of hay or turnip sometimes in their place. Thus if wheat is sown upon the fallow, a crop of turnip may succeed; after the turnip, barley, and so fallow again; or if the farmer has no dung, oats may be sown upon the fallow in the place of wheat; and then turnip and barley. If the farmer confines himself to oats and barley, a crop of hay may be introduced in the place of the turnip, barley on the fallow, then hay, oats, and fallow again.

We cull the following anecdotes from "Rural Sports":—

VORACITY OF PIKE.

Gesner says, that a famished pike in the Rhone, fixed on the lips of a mule that was drinking, and was drawn out by the beast before it could disengage itself; that people have been bit by pike whilst bathing, and that they will even contend with the otter for its prey.

In 1798, whilst two gentlemen were angling in a pond near Warnham, in Sussex, a pike, weighing upwards of 7 lb., seized a dog that was lapping the water, and was landed by holding fast to the dog, to the astonishment of the fisherman.

Papers by Tim Bunker.

:LVI.—TIM BUNKER ON TAKING A FARM.

R EDITOR,—Deacon Smith has just been in to talk over the matter of buying ı for his son David. You see, I have lots ghbours that come to me regularly for ad- since I took to writing for the papers. I t I have about as much business of this on my hands as if I had advertised w that card would look in the papers ! neighbour wants to buy a horse, I am ted to tell him whether he is sound, just I could read his in'ards like a book. If er wants to sow wheat, he seems to think ı't grow until I have told him what field to t on. I declare I believe some of them water won't run in a drain tile, unless I quinted along the bore, and told them just nuch fall they must have to the 100 feet.

TIMOTHY BUNKER, Esq.,
Consulting Agriculturist.
tertown.

ı see, the farming business is not done yet, hstanding the hard times. A good many factories have stopped, and some me- s that have been doing pretty well are now Nobody now wants to buy a fine carriage, build a splendid house. People who have do not like to spend it for articles of ; and people who have got their living by g these things have been thrown out of yment. But the oldest of all employments a thriving business, though the profits are ite equal to what they have been. We and take farms, and expect to do so for ime to come. I rather think farming will best business going for some years to come. eople, we have been living altogether too r the last twenty years. The change in le of living would make the bones of our rattle in their graves. We have got to back to a more simple mode of life, and less on our stomachs, and a good deal less ır backs, especially our women. Only nk of a £250 shawl on one woman—a year's rent of a farm on the shoulders of ndividual ! They do say the like of it might be seen in your city less than a year ago. I rather think some of those fast men, with their fast wives, are wishing they had some of their scattered coin back again in their tills. Why, my mother, bless her memory, never spent £250 for dress in her whole life, and she lived to be eighty. Now, there is reason in all things, as she used to say, and we have got a good deal more reasonable in our family expenses.

A good many, like Deacon Smith's son David, are beginning to see a comfortable, honest, happy life on a farm, who would otherwise have been tempted to try their fortunes in the city, and gone to ruin like the thousands before them. I have thought a good many would be looking towards the farm this year, and the substance of my talk with the Deacon might be useful.

I lay it down as a principle, that a man ought to own at least half the capital he means to invest in farming. If a man has nothing but labour to dispose of, he should sell his labour to the best advantage, until he accumulates sufficient capital to set him up in business. Not one man in a hundred will succeed who runs in debt for his farm and stock. There must be a large amount of interest money to pay every year, and this will be a heavy load to carry, with all the other expenses. But if he have money enough to stock 100 acres of land, he may safely run in debt for the tools and manure. We must have some floating capital always on hand, to take advantage of the times, and buy cheap when we can. If a man wants more stock, it is better to buy it when stock is low, than when it is very high. Sometimes a little extra manure will help out a crop wonderfully, and £20 spent in guano or bone-dust will bring back a hundred in less than six months.

Then a man ought to consider his own habits and tastes in the situation of his farm. This is especially important to men who have lived in the city, and enjoyed its advantages. Society is much more a necessity to them than to a man who has always lived in the country. He will feel uneasy without the daily paper, and a little of the stir to which he has been accustomed. He should by all means settle near a village, or on the line of some railroad. The farm, good as it is, will not be a substitute for every thing he has been accustomed to. And if a man have been bred to this business, he should consider what particular department of husbandry he likes best. A man bred to the routine of a grain-farm would probably do better with this than with a stock-farm. It is less important that a grain-farm should be near a village or city, than a farm where a mixed husbandry prevails, and where a near market is essential. A man with a genius for trade should farm near a good market, and raise everything that sells well, both animal and vegetable products.

If one has a fancy for stock, cheap land and a wide range of pasturage are essential to success. A valuable horse, or yoke of cattle, may as well be marketed 100 miles off as sold upon the farm.

It is always well to remember, in making a venture of so much importance, that farms, as well as men, have a good or bad reputation, that is generally deserved. Some farms are so fertile, so well proportioned, or so convenient to market, that they have always kept their owners in thriving circumstances. Trace their history far back, and you will find every owner what the world calls a lucky fellow. Other farms have the name of always keeping their owners poor. Sometimes they are in an unhealthy district, and much sickness has made large doctor's bills. Now, unless you know just what the secret of an unlucky farm is, and can remedy it, avoid such a spot as you would the poor-house. You cannot afford to try many experiments in a matter of so much importance. Is it a marsh that needs draining? You may safely venture, for there is wealth as well as health in knocking the bottom out of it. But, as a rule, it is better to take a farm that has a good reputation. If it has made others prosperous, with better husbandry it may make you rich. TIMOTHY BUNKER, ESQ.

NO. XLVII.—TIM BUNKER ON TOP DRESSING AND AFTERMATH.

A SECOND LOOK AT HOOKERTOWN IMPROVEMENTS.

"Bigger than 'twas last year," said Seth Twiggs, as he looked over into the horse-pond field, where I was mowing this morning.

"I declare it looks like a rye field," said Mr Spooner, as he measured a head of timothy grass 10 inches long, by a small rule that he carries in his pocket. A mighty accurate man is Mr Spooner! I expect he gets in the way of exact speech, studying his sermons, for he makes the joints fit so close that they won't leak water. When he says 10 inches, you may know it ain't a-sixteenth short. I should expect to find it a quarter over.

"You see it is up to the Squire's breast, plump 4 feet high," exclaimed Jake Frink, as he leaned over the wall. "Guess I was the biggest fool in town when I sold that piece of land for a song!"

"Not half so big a fool then as you are now, for keeping the better half of your farm as starved as this was three years ago," I replied.

It is curious to see how the minds of some people work. They see no beauty or value in anything until it has passed out of their hands, and begins to shew its good points under different treatment. This 2-acre piece of ground, which was always a quagmire and an eye-sore to the neighbourhood, when Jake owned it, is now a very charming spot, as the grass turns out 3 tons to the acre. It never paid him the interest on £3 an acre. It pays me 10 per cent. on £300, to say nothing of the satisfaction of turning a swamp into a meadow.

Seth Twiggs is right about the size of the grass, and yet I have done nothing extra for it this year. To be sure, the season has been more moist, but that hardly accounts for the difference. You see, in draining a piece of wet land 2 or more feet deep, you bring a large quantity of surface soil gradually to the action of the atmosphere, and of the rains and frosts. It undergoes a curing process, and the soil improves year by year, until the water line is reached. This is the third crop I have got off this field since I put the drain down, and each year has been a marked improvement upon the last. I suppose I might cut a second crop if the field was not so handy for pasturing.

And then I have noticed that it is a good plan to feed and mow alternately. I much prefer to mow a common meadow one year, and pasture the next, than to mow straight along for four or five years, as most farmers do. If a meadow is very rich, like this drained field, I think it does better to feed the second crop, than to mow it. If it produces 1½ ton at the second growth, as I think it will, of course so much is returned to the soil in the manure of the cattle. And then I have another important advantage in the seeds of the clover that are scattered by the cattle. I have noticed that the second growth of clover starts immediately, and as I do not turn in until the last of August, many of the plants, both of the white and red, go to seed, and are scattered before the cattle eat them. I do not believe in feeding late, but leave time for the grass to make a good covering for the roots. As a result of this treatment, I find that clover does not die out the first year as is usual. I have a good deal of clover in fields sown three years ago. Natural grasses are benefited in the same way, and the sod remains thick and strong. I have sometimes thought that the feet of the cattle acted like a roller, pressing the seed into the soil. At any rate, the fact is as stated, and I do not mow any second crop where I can pasture it. I don't think second mowing pays best.

"Have you got rid of 'em?" asked Jake Frink, as he looked over into Uncle Jotham Sparrowgrass' reclaimed bog.

"Rid of what?" asked Jotham, with feigned astonishment.

"Why, these insects that used to eat up all the outside rows of corn in your field and mine."

"Haven't seen an insect in these parts for well-nigh two years. Have seen some corn, though, and occasionally a potato," said Jotham, with a swing of his cane that shewed he felt as if he was lord of all he surveyed.

He dug over 300 bushels to the acre there last autumn, and the part now planted to that crop is as handsome as anything I have seen this season. Uncle Jotham manages pretty well for an old-style farmer, catching at any improvement with a good deal of eagerness, but stoutly denying that it is new. He has always seen something like it, thirty years ago. He has had, this year, in about equal patches, potatoes, wheat, oats, and clover. The clover was quite too large for good fodder, or would have been, if he had let it grow till the usual time of cutting. But it was cut in June, a thing he would not have thought of three years ago, and he will have at least 2 tons at the second cutting, if he does not steal my thunder, and feed it off. But if he does that, he will be sure to state positively that he knew others do the same thing as long ago as when he was a boy.

Coming back to my horse-pond field, Mr Spooner had to ask, "What makes that grass so much heavier on the back part of the field? It is almost another storey high."

"Well, you see, thereby hangs a tale. Last year, as soon as I got through mowing that part of the field, say about the 10th of July, I spread on a few loads of compost there, and you can see just where it stopped. The compost was made of pig-stye manure, with muck rather fresh dug. I had a good deal of anxiety in my own mind about the best time of spreading manure on mowing land, and had pretty serious doubts about midsummer, and feared the loss of ammonia, &c. This don't look as if the manure lost much of its strength. The rest of the piece was top-dressed in March, and it is not near as heavy. I am not prepared to say exactly that I think midsummer is the best time, for I suppose the grass has not got all the strength of the manure put on this spring; and another season, or the after-feed this year, may make the case look different. I have no doubt the manure put on last summer acted as a mulch, sheltering the roots of the timothy grass, which suffer extremely, and are often killed by too close cutting. The roots got strong and vigorous during the autumn, made a good math for protection during the winter, and started early this spring.

As advised at present, I should *put manure upon any level piece of land, whenever I happened to have it.* I think it will pay better interest on the meadow than in the yard, and, accordingly, I shall clean up this month, and spread every spare load I have upon the meadows.

Cutting 1 ton of hay to the acre don't liquidate, when you can get 3, just as easy, with more manure.—Yours to command,

TIMOTHY BUNKER, ESQ.

NO. XLVII.—TIM BUNKER ON THE VALUE OF MUCK.

"Hain't you got most tired on't, Squire?" asked Jones, as I carted along my twentieth load of muck last night.

"Guess not. Why?" I replied.

"It's a mighty deal of hard work for nothing. I'd just as leeves have so many loads of snow banks in a barn-yard."

"It's all moonshine about there's bein' any vartu in muck. I'd jest as soon dung a field with icicles," chimed in Tucker, who gets his ideas and his drinks from Jones.

"Them's my sentiments exactly," said Jake Frink, as he met us in the road, with a load of oats in bags, going down to Shadtown to market. "You see I was over-persuaded one year, when the Squire bo't the horse-pond field, to try some of the mud that come out of the side of the road, where the pond used to be. I guess I carted a dozen load, and thought I was going to see corn straw as big as your wrist, and ears as long as a hoe-handle. And I du declare I never could see a bit o' difference where I used it."

"How much manure did you put on to the acre?" inquired Seth Twiggs, as he drew a lucifer across the tap of his boot, and lighted his inevitable pipe.

"Wall, I made a whoppin sight that year, and slapped her on ten loads to the acre."

"Corn must 'ave been skeered at such duin's, I guess," said Seth, with a twinkle in his eye that the smoke could not hide.

"Corn didn't come up well, did it?" asked Seth, pursuing his catechising.

"Wall, yes, it came up, but looked mighty yaller, and didn't begin to grow much till into June, and then it was spindlin, and a great many stalks didn't have any ears on 'em. It was that cold frog mud that pizzened the sile."

"How much corn du you git to the acre, Mr Frink?" asked Seth, civilly.

"I guess about 20 bushels, on an average, sometimes a little more—and sometimes less."

"And how much manure do you put on to the acre?" continued Seth, determined to get to the bottom of the matter.

"Wall, that is jest as it happens. I allars put on all I make, be it more or less, p'raps fifty or sixty loads on to 8 or 9 acres of plantin. It's real dung, though, and none of your bog moss and stuff."

"And how do you suppose Squire Bunker gits 80 bushels of corn to the acre?"

"Wall, his land allers was better than mine; and then he has more cattle to make more manure, and he buys lots of guanner and bone dust, and all the ashes folks makes in the village, and sets every boy that's big enough to run on tew legs to pickin up bones, and buys every ded hoss and rotten sheep, and murdered cat, shoemakers' parin's, old boots, ded hens, old rags, and feathers, sticks 'em into this muck, and makes manure. If a man has money 'nuff to buy carrion, he can make manure and make crops, but ye see it costs more than it comes to. And then, who wants to be runnin an opposition line to the crows? The Squire is great on ded hosses, depend on't. The crows haven't had a decent meal of vittles the last five years, the Squire's been so spry after every ded critter."

Jake Frink touched up his nag and disappeared rather suddenly after this display of his philosophy of big crops. There was, of course, some foundation in truth for his reflection upon *my* methods of making manure. But neighbour Frink displayed his own pride, as well as my humiliation, in his remarks. One would hardly think it but Jake Frink is really above his business and is ashamed to do what ought to be done, to make the most of the materials within his reach to enrich his stores of manure. You see, this digging mud is nasty business. You must soil your boots, and your shirt sleeves, and a splash of mud upon your shirt bos
uncommon. And the handling of dea
and other diseased animals is not pa
savoury. But then if a man is going
farmer, he musn't faint at the sight
things, or carry a smelling bottle to k
the stenches. Muck makes *clean* cor
as gold, and the sweetest of flour, and
and putrid flesh in the laboratory of t
turned into luxuriant grass, which m
milk, cheese, and butter, and plenty of i
a farmer, and "nothing else," as the b
go in for muck and more of it every ye

You gentlemen that edit agricultur
attend the shows, and see almost nobo
best farmers, who carry out your teachi
the world is almost converted to yo
You have been preaching about muck
years or more, and you may think th
body understands it, and everybody
much as they ought to. You never
greater mistake in the world. I tell
millennium hasn't come yet, by a long
guess one-half the farmers in these pa
have got Jake Frink's notion about mu
rests upon just his sort of trial—a sing
ment based on an application of ter
half-made compost to the acre. No wo
muck is considered poor stuff.

Now I am ready to give a reason for
that is in me. On my old land I can
any money at farming without manure,
ing muck is the cheapest way I can
Indeed, I should not know what to d
muck. If manure is valuable to the fa
has to cart it several miles, it is certai
as much, or more, to the farmer who
and uses it upon his own farm.

On the muck that I am able to cu
fields where I use it, I make a large p
save one carting. This I cure with st
ure that I buy from the village, and
dead animals, guano, or with lime a
taking care not to use these latter art
the animal manures. If anybody dou
my estimate of muck, let him come to
town and see my corn bin and porkers
stores and cows, and my hay ricks a
stables. Jake Frink despises a dead
invokes crows. I think the carcass wor
and save it. There is as much differen
as in anything.

Yours to command,

TIMOTHY BUNKER

The Garden.

FRUIT CULTURE IN THE GARDEN.

WE certainly wish to see a MORE EXTENSIVE SYSTEM OF FRUIT CULTURE throughout the gardens of the country. Farm and cottage gardens are particularly bald, as a rule, in the matter of fruit trees. Many a good acre or rood of ground is improperly utilized. If we inspect the kitchen gardens, they are fruitful of potatoes, and such useful culinary articles as respective families decide upon to sow or plant, and grow; and that so far betokens usefulness, and consequently must be right. But nearly the same return of vegetables can be secured by attending to, and catering for, a crop of Pomona's gifts. It need scarcely be explained that we allude more particularly to the introduction and cultivation of pears and apples (and plums ndeed might be added) as standards for the open quarters of ground in almost any kind of garden.

The mooting of this subject, and the agitatng it before the understandings of a reading public, not undesirous of acquiring informaion, is not only a paramount necessity upon he ordinary plea of class, or rather technical, ducation, but upon that omnipotent plea of ontributing to domestic economy and comfort. Great as is the power of certain organs hat direct horticultural advancement, they ever, to our thinking, have wielded it with nything like an energy and a will towards ncouraging a very large class to improve eir holdings, and reap the corresponding ward, in the matter, shall we say, of *la petite* uit culture. Not that we blame them for eing unequal to the task to which they have mmitted themselves; for the education imarted, or rather the bill of fare presented, as ny regular and studious reader can observe, as extensive in detail as it is safe in its aching—fruit culture, in general, not excepted. But to stimulate the apathetic, to fire the zeal of the wavering, and "to prepare the way" for all, the strongest influence of the "organs" in question are in request. To shew a discerning and a trusting public that decided reformation is desirable, the leaders of opinion—the captains and lieutenants of essay and debate—must shew a spirited front. They must not remain listless if the point at issue is to be *fruitful* in its results.

Some of our readers in contemplating the idea of eventual large trees of apples, and pears, and plums in their gardens, probably may think us unsafe instructors. They may ask us how we can reconcile the feeding ground of fruit trees and that of vegetables in common, without destruction in degree to both; they may point to the very grasses of the field being less productive under the permanent summer shade, and ask us how, with a screen of foliation of the kind, crisp, sweet, juicy vegetables can be expected?

To this we reply that our possibilities only could become practicabilities by adopting the *fashionable* style of fruit culture. "Fashion is fitful, and not always becoming," some cynical follower of Diogenes might exclaim. We might dispose of this averment, in the interest of our lady constitutents, by treating it with silent contempt. Let us explain and expound this much, however, that thefashionable style of fruit culture is very becoming, is very productive, and occupies wondrous little space. It neither is very avaricious in its monopoly of atmosphere, nor do its fellows wander very far from home in search of food, so that in the one case, air is admissible to the more immediate ground tenants—the rank and file of kitchen-garden produce—and upon the feeding table are atoms of food at all times sufficient for all who come within its bounds.

"What an admirable style that must be!" is doubtless all but the universal exclamation. "Why have we been so long kept in the dark about it? What is it, pray?"

It is simply growing a select list of apples and pears upon the plan recommended by our valued correspondent, Mr Barron, at page 417, vol. iv. Speaking particularly of apples, we say grow them (buy them first of course), and pinch and train them as *pyramids* upon the Paradise stock. Now, there are several sorts of Paradise stocks, but one of the best for keeping trees in a dwarf state, consistent at the same time with health and fruitfulness, is the French Paradise. And then if fine luscious pears be wanted, that will generally be more prolific in fruit buds than wood buds, they must be grafted on the Quince stock. Their dominion both heavenwards and earthwards is more limited than if grafted on the Pear stock, and the fruit returns are generally larger, and far more certain.

But why confine such a remunerative system of cropping to the kitchen gardens alone? Why not carry the influence, as our correspondent suggested so opportunely at p. 416, to the mixed shrubberies, to the spacious as well as to the limited lawn, even from an individuality point of view. "Is there," as is well said, "no beauty in Pomona that we can call to our aid, or why should we everlastingly call upon Flora for everything that is beautiful in the embellishment of our gardens? Fruit trees have flowers as well, and thus they have a double season of beauty for us—beautiful when in flower, beautiful when in fruit, pleasing to the eye and to the taste, ornamental as well as useful—doubly gratifying and doubly enjoyable." In these shrubberies there is no need to disturb the natural bias n the way of extending their growth. Branches may be thinned out and otherwise nfluenced to carry quality of produce, but they need not be crippled in outline to assume a formal appearance. Their extension may be co-extensive with other arborescent, or rather suffruticose plants. It would not be wisdom to introduce them among the stately fellows of the forest, for in time, if it was an object to perpetuate forest-tree life, their best efforts would be discomfited. The war struggle would tell upon them to extermination; and their trunks and branches would be clothed with a host of epiphytical lichens and mosses that are the sure precursors of decay and death.

But we spoke of them in their individual form, as suitable for taking position in lawns and other conspicuous places. In the great and very proper demand there is for what are popularly called berried-plants, there seems no position too good for them, and yet many of them are only beautiful to the eye, and have no claim upon the palate. To use a Scotticism for the nonce, "red-cheekit" apples are fully as ornamental as red-berried Aucubas, and there is plenty of room for both. The Bird's-eye cherry is scarcely more ornamental, at the flowering period, than any other cherry, and yet some of the sorts confined within the four walls of a kitchen garden please the palate either as an article of dessert or as a preserve, over and above pleasing the eye in time of flowering. In regard to controlling wayward habit when removed from Nature's scenery, or an approach towards that style, the finger and thumb and the pruning knife can come in to the rescue; and it is rather a pleasing operation to use the finger and thumb on a growing plant to balance proportions and keep it within the prescribed rules, which the more formal gardening contiguous to villas demands.

In passing, we may remark that the pioneers and devotees of that school of restricted landscape gardening are apt to run their hobby of imitation of Nature, if not to death, at least to the extreme verge of ridicule. Art is manifest in all the undertakings of men; and not even Repton, Loudon, and all that school, will make sensible men and women believe that what they advise as certain imitations of Nature is like Nature. In very many cases it is only a clumsy substitute of art. It is therefore not offensive to modern ideas and correct taste to control the habits of plants, so as to hem more pleasing to the eye. We elieve, we beg it to be understood, in ting of shrubs after the imitation of pea- ind crowns, and cones, and tables, and but a moderate use of dressing and g, in connexion with any geometric nal design, is just as necessary, and is well become the plants, as the barber's periodic operation becomes the heads of the lords of the creation.

There is another phase of fruit culture, much patronized by our French neighbours, which is well suited for villa gardens—the *cordon* system. Upon that and other matters incident to the whole question, we shall reserve our remarks for a future issue.

THE PREPARATION OF GRASS LAWNS.

E preparing of grass lawns, so as to ensure beauty and permanency, is a t of considerable importance, and one ing of more attention than is generally) it. A house is no sooner completed ie ground intended for a lawn is levelled iwn down, the edges alone being turfed. od turf can be procured, and the lawn ver large, it is better to turf it all ind thus secure a good and permanent ; but if it must be sown down, it is tely necessary that the lawn portion of ind should be thoroughly cleansed perennial and annual weeds—the for- oy deep digging or trenching, removthe same time all the perennial roots; e latter by one or two hoeings, during eather, before sowing, allowing a fort- o elapse between each cleaning, so as : the annual weeds time to braird before cut with the hoe.

several occasions I have been asked to t some recently sown lawns, and to iy opinion regarding them. The young n most cases was completely covered reeds, and the owners blame only the ian, who, they allege, must have suphem with an inferior article, full of the of annual weeds. Instead of this being se, the fault lay entirely with themselves cleaning the ground properly before . If the surface soil has to be covered irf, it will effectually smother the an- reeds, while if any of the perennial emain in the ground, they will sooner or later form a crown and push through the new-laid turf.

In sowing down a grass lawn, I generally recommend the fine-leaved perennial rye-grass, mixed with about 16 per cent. of the crested dogs-tail grass, to be thoroughly mixed, and sown without any clover. All clover mixtures make a fine appearance at first, but much of it ultimately dies out after injuring a large proportion of the tender grass, and the bare spaces thus formed get covered with moss. If the spaces are small, the grass will soon "stolon" out and cover it; but if large, it will take years to accomplish the work. In the meantime the ground gets covered with daisies and rib-grass. With these blemishes, the lawn is anything but satisfactory, and in many instances, even at the end of several years, the whole has to be dug over and re-sown. Considering the great annoyance which many proprietors have experienced with their grass lawns, it is better, and certainly much cheaper in the end, even although the cost at first should be more than doubled, to lay it with turf. In doing so, care should be taken that it is both old and clean.

One of the greatest pests of grass lawns are the dandelions. Sometimes parties do their best to extirpate them, but this is often a thankless job, as it frequently happens that some waste ground in the vicinity is infested with them, and the seed, when ripe, is wafted all over the neighbouring gardens. I have observed several lawns so covered with dandelions, that the owners have caused them to be dug over, cleaned, and re-sown; but this is often only a waste of time, as the portions of the root left in the soil are sure to grow, notwithstanding the removal of the head or crown, no matter how deep. If the turf is at all good, although well sprinkled with dandelions, it might be perfectly restored, simply by removing the surface turf of a moderate thickness. The dandelion tops will come out readily by a slight pull with the hand, being severed from the roots while raising the turf; the ground afterwards to be thoroughly dug and broken up, and all the roots carefully removed. This done, level the ground again, put a thin sprinkling of leaf mould on the surface, and relay the turf taken off. If the weather is at all dry when the turf is laid down, a little artificial watering will be necessary.

Daisies, although exceedingly beautiful on grass lawns, are often very destructive to them, and their increase should be prevented as far as possible. It surprises many a one to witness the rapid progress made by this little plant, both on lawns and gravel walks: this is owing to the heads not being sufficiently swept away after being cut with the scythe. Although cut when in full flower, the heads dry and the seeds become perfected just as readily as if they were allowed to ripen on the plant.—*James M'Nab, Royal Botanic Garden, Edinburgh.*

BUDDING OF ROSES.

SECOND ARTICLE.

OTHER MODES OF BUDDING—THE AFTER TREATMENT OF STOCKS, BUDS, ETC.

IN my last paper on the budding of roses, I did not specify the places for the buds so clearly as might have been done. It is of great importance that the buds should be kept at home—that is, as near the main stem as possible. Fig. 1, *a*, will illustrate my meaning to the uninitiated. The buds should be inserted at 1, and not at 2 or 3, for two reasons. They are brought closer to the source of growing force—the stem—and we thus get rid of all wild shoots. If the bud is inserted at 2, the whole space from the main stem to 3 will always be sending forth a fruitful crop of branches. Of course, if the bud was inserted [illegible] would be increased by the greater [illegible] wild branch. But at the place recommended there is little room left for robbers stealing away the life-blood from the scion. Of course, if old eyes are allowed to grow, the cultivated eyes will perish; for nature will constantly master art in the struggle for life. It is the extreme of folly to allow wild shoots on budded or grafted roses; and they seldom are permitted to remain long. But the sure and certain penalty exacted for budding away from the base of the branch is an annual crop of wildlings. The temptation is strong with the amateur to bud out some little way from the base of the shoot, the branches are easier managed, the manipulation sooner completed. But none of these things must move you from the right point, which is so close to the bottom of the branch that the lower end of the bud shall touch the main stem of the stalk (see fig. 1, 1).

This distance from the main stem is of more importance than the position of the bud, the form of the slit, or shape or size of the bark case, provided the bud is uninjured and the union is close. None of these things will move it from growing. Some prefer inverting the bud and placing it head downwards. I never could see any advantage in the arrangement, and it has an uncomfortable look about it. But as far as the growing is concerned, it matters nothing. I well remember one of the first lessons in physiology taught by the late Dr Lindley. It was, that cellular

: was permeable to the transmission of in all directions. Consequently a cur- may be diverted in vegetable tissues)ut inconvenience. Hence, quoth the or, inverted cuttings will grow. I did at the time believe it. But experiment)lished the Doctor's theory. And if cut- ;, why not buds? But for what good? nfess I never saw any. They take no :r inverted, so we dismiss this plan with- 'urther notice.

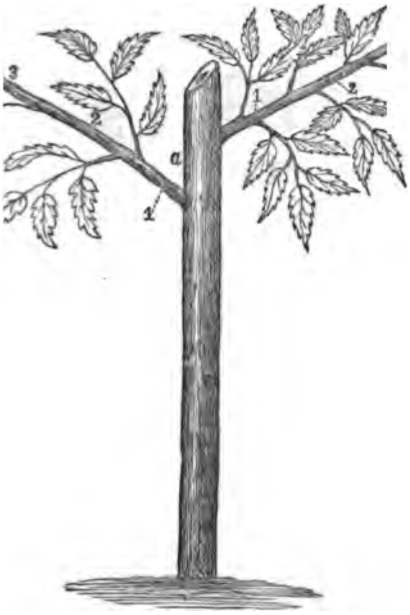


Fig. 1.—Process of Budding.

ther modes are, cutting out a square e of bark, or a triangular piece, and cut- the scion to suit. These modes take e time, and possess no advantages what- over the ordinary method. Buds of either iese, or any other form, may be inserted ie usual way, and placed under the bark n the common method. When this is e, the form is not at all material, if suffi- t bark has been left at the base of the to nourish it until the union is suffi- tly accomplished to enable it to draw)lies direct from the stock. But in some iese methods of budding the bark of the k is removed to admit the bud with its , both being cut exactly of the same form, so that the edges may fit to a nicety all round. The points of union may then be smeared over with grafting wax to exclude air, and the process is completed.

There is yet another mode of budding, with what may be termed small-based buds: the bark of the stock is not removed, but loosened on three sides, leaving it attached at either top or bottom. It is then rolled up or down, the bud inserted, and the bark replaced over it, an incision or a hole being made in the bark of the stock to allow the bud to project through it. If the loose edge of the bark be made fast with a tie or mastic, this plan of budding is as sure and safe as any other. But it is so necessarily tedious and slow in the case of trees with very thick barks, that it possesses no advantage over the common mode of **T**, or slit, or shield budding. What is called flute budding, or the removing of a piece of bark two or three inches long all round a tree, and the placing of another ring of bark of equal size, furnished with one or more buds, in its place, is not applicable to roses, and need not be discussed

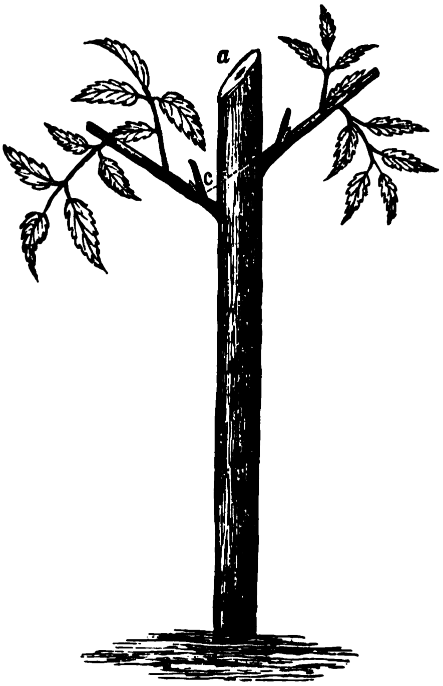


Fig. 2.—Process of Budding.

here. The buds take very well; but this is perhaps the slowest and most tedious and difficult of all modes of budding.

Occasionally, roses are budded in the spring, and, indeed, at any season, with a slice of wood attached to the bark. The thinner the wood the better, as a rule, such buds take, unless for spring budding, and the budding with eyes in a dormant state, and in dry seasons, or when the proper season for budding has been lost through some cause. Wood or bark budding has nothing to recommend it over the usual method. The French and Germans are most expert budders, and will insert fruit buds, or, some say, rose buds in barren trees, performing this operation so skilfully as to get a crop from such transferred buds the same season. Amateur gardeners can hardly expect to reach such perfection in budding; but these instructions ought to be sufficient to enable them to bud their roses with comfort, confidence, and success.

From these other, but none of them better, modes of budding, I will proceed to give a few hints on the after-treatment of stocks and buds. Many stop the branches a week or so before budding, as in fig. 3, but it is much better to leave them unstopped as in fig. 1. The unstopped shoot will be sure to draw a full current of nourishing sap right past, and, if all goes well, through the bark of the inserted bud. It brings a stream of living water near for it to draw from. This is of immense importance for the well-doing of the disabled bud. The bud with its base of bark cannot exist long on its own resources. It is quickly emptied of fluid, and if more is not at once forthcoming, the bud languishes nd dies. There is no remedy for it, the plant perishes from sheer exhaustion. It is elf evident that the greater the supply of ood that is passing along the whole course of e branch, the better chance the foreign d has of being replenished through its ase. Now, suppose the branch is stopped ck to 3 or 2 in fig. 1, the first result of such stopping is to arrest the flow of the sap, for growth is not simply an expending, but also a collecting and carrying force. Stop the branch and you stop the sap, or modify or cripple its force and volume. Indeed, t much is generally admitted. No ski cultivator would think of stopping and b ding simultaneously. The stopping alw precedes the budding from a fortnight tc month. The theory is, that by cutting b to 2, the sap is forced or dammed up i the buds left; consequently, that these b will be better fed than if the shoot had b

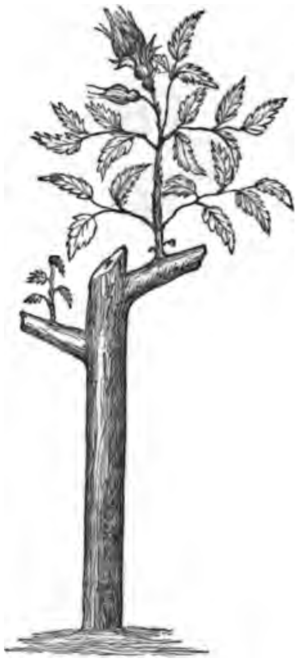


Fig. 3.—Process of Budding.

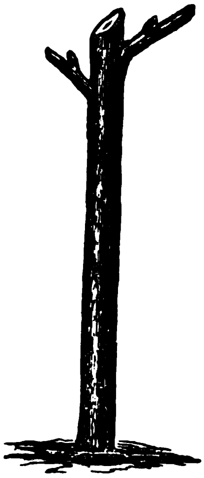


Fig. 4.—Process of Budding.

full length. It is assumed that sap e concentrated; but this is a mis- he fluid that nourishes the buds n the root upwards—not from the nwards. And more pertinent still, and volume of the nourishing stream ed by the growing power of the erefore, the stopping brings less, sap within reach of the newly in- d. Stop not at all until the bud is d into its new home.

I have made the reason why we t stop the growing shoot plain to ers; but if not, they can at least d the short order—don't stop before nor after it either, until further orders. anctions the wisdom of this advice, g the largest per-centage of buds to e least time, on the stop-not-at-all

But when are we to stop these Well, that depends upon the season ar, the state of the buds, and the s of the grower. If you bud early and the buds break into shoots as ey have taken, the wild shoots may cut back, as in fig. 3, in a month weeks from the time of budding. ls will form large strong shoots at l yield good autumn blossoms the . They will also ripen sufficiently the winter with impunity. All these e important.

you bud late, and the buds take, but lisposition to grow, leave the cutting- September; and then only cut to . Any strong shoots that come on branch should be rubbed off, to pre- ir robbing the buds; while the f sap-run will hinder the rose-bud sting into leaf. In December, the ches may be further shortened, as ; and not till the end of March, e whole of the stock be cut off, as and 4. The object of all this is to n without unduly exciting the buds. buds to remain at rest—not in till the branch is safe amid genial sunny skies.

are yet later buds which take, but swell at all in winter. The stocks that bear such may be left full length till November, when they should be cut back as in fig. 2. At the end of March cut them finally in as in fig. 4. This cutting back is fully half the battle. Stop the budded branches too soon and you starve them to death by interrupting the flow of the sap. Prune too severely and you develop buds of choice roses into leaves and watery shoots, to feed John Frost in winter. Stop not at all, and the wildlings run away with the adopted children's bread. Judgment, caution, skill, and practice are needed in this matter. It may seem difficult to the villa gardener now, but it will be easy enough by-and-by when you have budded and got over winter and spring, for the latter is the most difficult season for incipient rose buds.

Next in importance to the untimely stopping is the final untying. This should not be done until the following summer. And when or before it is done, each young shoot should be carefully supported. The simplest mode of doing so is to tie one or two small sticks about one foot long to the stem or the stock, and support the young shoot with matting, This simple arrangement prevents the most provoking contretemps that can happen to the rose grower—the up-rooting and destruction of the new branchlet by the wind. Then, indeed, love's labour is utterly lost. Our labour, skill, care, and a year's growth, are gone from us for ever on the wings of the wind. Fore-warned—fore-armed; therefore see to your ties at once. It is a good plan to tie on the stakes as soon as the buds reveal for a certainty that are in process of elongation. If what must be done were always done early and well, we should have fewer fair tender hopes to bury in the bitter grave of disappointment.

One more point about the stocks, and I have done for the present concerning the crown or top of the stocks. To this end, give them a good pitch, as at *a*, in fig. 2. This will send the water off as fast as it falls. The next point is to have as little crown as possible. Reduce the length of the crown, by cutting it neatly down to the dotted line at *c*, in fig. 2. There will thus be less to keep dry, and the base of the highest bud will have an opportunity of growing over it. Nothing can be worse, or a more slovenly-looking practice, than that of having a bald, bare, half-dead crown standing up in the centre of a rose tree. But merely reducing the crown will not suffice. It must actually be waterproof. More roses perish from exposing their pith to the weather without protection, than from any other cause. The insects and cold hold a very carnival of ruin amid the pith and heads of our standard roses. Their vital parts must be water-proof, and, as far as may be, weather-proof. Various specifics are used for this purpose: paint, tar, resin, mastic, &c., are laid on. The one antidote to injury through the crown is a water-proof cap. It matters little what it is made of, so long as it does not poison the plant. I dislike tar, but grafting-wax, thin putty, or thick paint, answer well.

A plan has just occurred to me as I write, which would beat all the others. The other day I read in the papers of a surgeon providing a gentleman who had lost his nose with a new one out of his own *forehead!* I purpose making the rose stocks a new crown in a similar manner. When the sap begins to flow in the spring, unroll, say an inch, or an inch and a-half, of the bark; cut so much off the top of the stock smooth, and level the cut nicely. Replace as much bark as will completely cover the crown, and bring the end of the overlapping bark under the side bark opposite, like the hasp of a padlock. In a fortnight or so, the stock will be furnished with a new crown, warranted to last for life, and never to become bald again. I think I ought to patent this invention, for enabling stock heads to heal their scars and renew their youth.

Such an arrangement, by protecting the central tissue of the plant from injury, cannot fail to promote the strength, and prolong the life of our rose trees. It affords me much pleasure to lay this new method of "wigging" rose stocks before your numerous readers.—*D. T. Fish, F.R.H.S.*

A PRACTICAL PAPER ON BUDDING.

THE propagation of favourite flowering, as well as fruit-bearing arborescent plants by budding, is at once the easiest and most expeditious mode of effecting that important end. And although many are deterred from attempting the operation, from a notion that it is so mysteriously difficult that they need not try it, all such supposed impediments will be found to vanish, even by the most uninitiated, who will, in making trial, attend to the following directions. Although mainly intended for inexpert villa and cottage garden owners, they may also be indulged in by the less fortunate city dwellers, who have no ground of their own to cultivate; or a bud inserted by any of them in a wayside thorn or brier, when enjoying their occasional country rambles, may, at after visits, be watched in its progress with as much interest as if it and its surroundings were the budder's own. Beginners will always find thickish young shoots the easiest to commence experimenting with. And as they are also the best for illustrating the practical directions here given, those of the horse-chestnut have been selected for the accompanying engravings. Shoots of most roses, and ordinary fruit trees, although a good deal smaller, are almost as easily operated upon; and a little practice with them will lead to equal success in dealing with others that are much less, and consequently require more careful handling.

In budding, it is essential that the knife be perfectly sharp as well as clean; that the barks of both the bud and stock, but especially the latter, rise easily from their woods; that the shoots from which the buds are taken be sufficiently matured or changed from that soft watery appearance which they present on being pressed or cut into in their youngest

;e. The tying material, or ligature, should sufficiently strong, soft, and pliant, to n a good air and water excluding envelope. regard to the budding knife, any of those ivory or bone handled kinds sold in seed l hardware shops, will do; although some 'e a preference for particular forms of both de and handle. In the absence of these, inary pen or other pocket knives may be cessfully employed. And it may be ıarked, that most people who carry small :ket knives will find that budding knives, n the thinness of their handles, are the st convenient for general purposes.

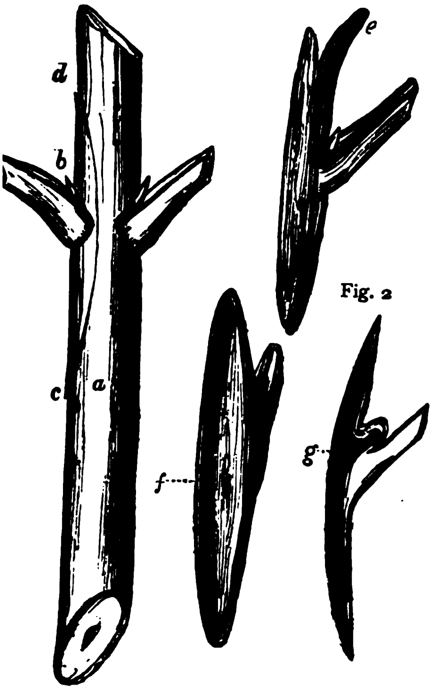


Fig. 2

Fig. 1. Fig. 3. Fig. 4.
Process of Budding.

There are various modes of budding, but following is that most generally practised: ving secured a young shoot of the current son's growth to bud from, cut off the ves, and, except about half-an-inch—more less—of their stalks, according to size and ds, fig. 1, *a*. Then examine each axil, *b*, l reject all that are without, or which have y very weak abortive-like buds. Next e hold of the shoot firmly between the thumb and first finger of the left hand, resting it at the same time upon the second finger, and insert the knife at *c*, cutting upwards under the bud, and bringing it out at *d*. Take now this detached piece gently between the same finger and thumb, keeping the cut side uppermost, bend the projecting upper end of the bark gently backward, *e*, so as, with the point of the knife and right hand thumb, to get hold of and abstract the wood from the bark, or "bud shield," as it is technically termed. Notice that the heart of the bud has not been taken out along with the wood, in which case a small hole will be apparent at *f*, a section of which is also shewn at *g*. The next part of the operation falls to be performed upon the stock, fig. 5, which may be of any size, from a shoot of the present season to an inch or two in diameter. In a smooth, clean-barked portion of it, make cross-like cuts, *h*,

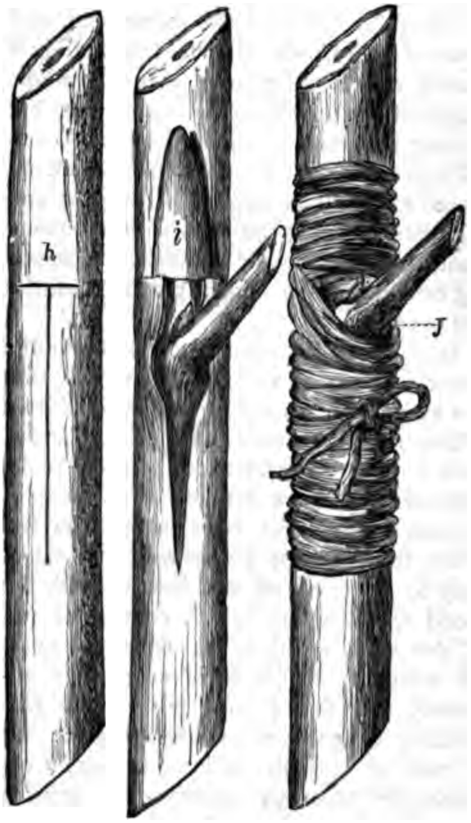


Fig. 5. Fig. 6. Fig. 7.
Process of Budding.

as deep as the bark; raise the two sides gently with the point of the knife handle, without injuring the "cambium," or wood surface, and insert the shield, *i*, cutting off the upper projecting parts at the dotted line, so as to include the whole within the cross, *h*. Tying, as shewn at *j*, fig. 7, must then be immediately done, with either undyed thick worsted, soft cotton, twine, common or Cuba bast, or other equally soft and pliable material. The two first of these are the best; and the worsted is generally the most readily obtained. Pieces being previously cut into suitable lengths, dependent upon the thickness of the stocks, take the ligature in both hands, near to the left-hand end, and commence tying by bringing it over the back of the leaf stalk, crossing it so as to lock or hold the shorter end, and allow of both hands being used in winding it closely over a little more than the whole length of the shield and wounded part, but leaving the point of the bud exposed, and taking care that all openings in the bark are closed against the admission of drought and rain-water. Tying the ends with a running knot, so as to be easily loosened for inspecting or relieving the bud, at pleasure, finishes the operation.

It frequently happens with buds, in the lower portions of well-matured shoots, that the woody part cannot be extracted without taking the bud hearts, *f* and *g*, figs. 3 and 4, with it. When less advanced buds of the desiderated kinds are plentiful, it is best to discard those lower ones altogether; but when these cannot be spared, the shield may be cut thinly off and inserted with the wood remaining in it. A continuous run of dry warm weather has often the effect of rendering the bark of stocks too adhesive, and this annoyance is more particularly experienced by rose growers; but it may be partially, and often entirely obviated by thorough watering the growing plants a day or two before they are to be budded.

Dull dry weather is the best for budding; and it should, if possible, never be performed in rainy or in very hot sunny days. The north, or shaded side of the stock, is the best in which to insert buds, but no part of it that is budded should be very much overshaded or choked up by either its own or other foliage: although, after the operation has been performed, a free growth of the upper shoots should be encouraged until the buds have fairly taken. In the case of roses and other continuous growing plants, that are inclined to push out immediately, they may be cut down to within two or three inches of the bud, and entirely cleared of all superfluous growths as soon as the bud has fairly commenced to push. But with plants which only make one definite growth in a season, it is best to defer the cutting down till the buds have begun to swell in February or March following, when their tyings should also be loosed. In all cases it is well to leave also two or three inches of the stock on which to tie the young shoot, and prevent its being broken off by the wind till sufficiently firm to require no such aid, when the stumps or heels should be cut off within a quarter of an inch above the shoot's base.

With modern facilities for transit, buds, such as those of roses and fruit trees, can be sent to Britain from most parts of Europe and North America, sufficiently fresh to take upon good vigorous growing stocks. Under any circumstances, and especially when some time must elapse between cutting off the stem and inserting its buds, it is proper to cut off the leaves as before mentioned; for, if left, they hasten the drying up of the sap, causing thereby the hurtful shrinking and adhering of the bark and wood. Shoots so prepared can be kept for two or three days by merely packing them in damp moss, and rolling them up in large green leaves and paper. Thin gutta-percha, or other air- and water-proof fabrics, form, however, a better envelope for them; and a further commendable precaution is to stick the lower ends of the shoots into potatoes, apples, pears, or such like reservoirs of moisture. If, however, they are to be kept for a week or two, it is better to seal the lower ends of the shoots, by dipping them, a quarter of an inch, or so, into melted wax or rosin; then pack them in sphagnum or other moss, l in water, and afterwards made as dry . be done by hand-squeezing; putting hole in bottles, which must then be corked; or in boxes, which may be of wood, or other substance, provided ls are closely fitted, and the whole sur- ed by any sufficiently strong and durable proof covering. Such packages should, rse, be kept as cool as possible during transit; and our concluding advice to beginners is: practice these most important operations, cutting off the bud shields, and extracting their woody interiors on all convenient occasions, till satisfied that the knack of operating quickly and correctly has been acquired; and then a little experimenting at inserting and tying, will make expert performers.—*William Gorrie, Trinity.*

ACCLIMATIZATION.

the sunny regions of the East, where the beardless unsophisticated youths of the suppose that rupees hang upon the le trees, and princely fortunes are to be or merely the lifting; where hardships, ty, and sickness are entirely unknown, very white man is a sahib gentleman ay he sets foot on these happy shores, atter what his antecedents may have although character and qualification, e remained here, might never have . him much above the stilts of a plough od, a goose or a last—no matter, there s a man servant to cook for him; another it on, dress and undress, wash his feet are his nails, and, if needful, fan or oo him gently to sleep; one to groom orse, and hold his stirrup while he ts; one to sweep the bungalo-house; o wash his clothes; and if he have a sahib—a better half—a man and his o nurse the baby; a gardener, and per- one of his journeymen, or else labourers, ltivate his garden, in which he may ly sit under the shade of his own vine ig tree, which will afford a grateful r from the burning rays and unpleasant of a tropical sun. And in the cool of ening, by way of refreshing himself, the sahib, and his darling baby, he can take e in his covered gig or carriage along tion Mall Promenade. If mortal can ly feel happy here, surely these are the ions to make him so. But still, with all the advantages and pleasures that affluence, ease, luxury, and a dominant position amongst a conquered and a servile race can bring, he seems dissatisfied with his lot, and is continually craving for other gratifications, which climate keeps quite beyond his reach.

The above is nothing like a full summary of the advantages that one resident there enjoys over his equals here. Indeed, it would be useless to attempt to disabuse some minds, because some assure their less favoured friends here that there it is a real paradise. However, a somewhat cynical friend of mine suggests that many—perhaps most—of these glowing descriptions, so full of poetry and sentiment, must have been written during the first month's residence there, and under the heyday of the honeymoon—under which blissful influences I regret not having seen that happy land. Neither is it my intention to give anything like a complete catalogue of the grievances that afflict the resident there, some perhaps imaginary and others real. Distance and ignorance on the part of those here, and snobbishness on the part of some there—a desire to be thought in circumstances widely different from what they really are—have thrown quite a cloud of exaggeration and romance over that, to most Europeans, land of exile, to which men voluntarily banish themselves for terms varying from three to thirty years; but one and all, with the same object in view—to leave it so soon as they find they can live out of it.

Almost every European in India has a garden, of greater or less extent, attached to his residence, which may either be laid out, tastefully decorated, and tidily kept, or the reverse—that much depends on taste and means. But whether or not an enthusiast in horticultural pursuits, he will no doubt, to a greater or less extent, try his hand at acclimatization. "Acclimatation" is the more modern and genteel way of spelling that word. In Britain one seldom hears the term used, and only in select circles; but in India the very opposite is the case—almost every one uses it, some attaching to it one meaning, some another, and the greater part no meaning at all, simply because those who have the reputation of being learned do so.

That its somewhat frequent use is an evidence of discomfort with, and dissatisfaction at, the existing state of some things, with the desire to make them better, there can be little doubt; because, through the efforts of philanthropic men, there now are, at least profess to be, associations and agencies all over the country, and, according to report, achieving great results in acclimatizing cereals, vegetables, fruits, animals, and even men. As it is only one or two examples of acclimatization, as exhibited in the second category, that are now to be spoken of, the others must be passed by without further notice. Some may, however, feel a little curious to know what amount of success has attended the experiments made on the last-mentioned organism. In answer to such, it may be sufficient to remark that degradation, physical, intellectual, and moral, have been the only, at least the chief, results wrought out in that most interesting experiment; all the bad qualities of the imported being strongly developed, without any of its redeeming virtues. Acclimatization, on man at least, has proved a grand mistake, let crotchety philanthropists talk as they will. I more particularly mention this fact, because articles in newspapers and periodicals crop up from time to time. Sometimes they are so ambitious as to assume the pamphlet form, one and all of which have a tendency to mislead, because they ignore the difficulties attending such a scheme and grossly exaggerate its advantages, perhaps unintentionally so, however. Those who love to hold forth on that subject by word and pen might themselves shew the example.

It has already been remarked that the term acclimatization is one in frequent use by most Europeans in India; however, there is a peculiarity in the manner in which it is used that can hardly fail to draw the attention of the most ordinary listener. It is applied loosely and indefinitely; indeed, its remarkable elasticity enables it clearly and accurately to account for changes the most dissimilar that can be imagined to take place in either animals or vegetables.

Any improvement in the condition of either races or individuals, no matter from what cause or causes, is clearly a result of acclimatization; or, if the individual or the race retain its ground without change in either direction, still the case is one of acclimatization; or, evident deterioration in the qualities of a race—esculents, for instance—accompanied with constitutional weakness, still the result is acclimatization; or, if the change happen to be in the other direction—increased vigour of constitution, accompanied with the loss of flavour, juiciness, and crispness, as in the radish, for instance; in short, the almost entire loss of these qualities which rendered it valuable—that, too, is a result of acclimatization. Finally, the truly orthodox adherents to this wonderful creed are quite agreed that anything that can live in India for two or three generations and reproduce its kind, no matter whether its constitution remains unchanged or changes, or what the character and amount of the change may be, either up or down, it must be thoroughly acclimatized. And to ask for proof for the general or particular sense in which the assertion may be true, is for the inquirer to expose himself to the imputation of ignorance and incredulity, accompanied with a look of scornful pity, which may have the effect of either extracting from him an abject confession of error and promise of amendment, or shew him the necessity for prudence and caution in future, is a bitter, still useful, lesson for him to learn. However, the representations of the other class who profess belief in this dogma—if

gree of assent that they give to it can
characterized—are much more mode-
their demands on the inquirer's cre-
Ask what the grounds are on which
elieve in the truth of acclimatization,
e reply, either tacit or avowed, is that
old no definite opinion regarding it;
cause men who have the reputation of
deeply read in the mysteries of nature
e it true, there can be nothing wrong in
ssenting to it also.
term Naturalization has some pro-
both in regard to the means used and the
t proposes to accomplish. When it is
at a plant has become naturalized, no
r whether only a worthless weed or a
le esculent, there is no doubt left as to
eaning intended to be conveyed. It is
y said that such or such has been intro-
into some country, and seems to have a
tution capable of withstanding all the
tudes of a climate entirely new to it,
endent of any assistance the introducer
nder it, and lives and reproduces its like
t any deterioration in constitution or
y, if an esculent. However, naturaliza-
s not unfrequently accompanied with
e, and that may be increased vigour and
lity, with coarseness and insipidity in
r—perhaps a result of the other.
s the field occupied by the naturalizer
definite enough in its limits, and limits
definite a manner that to be occupied
e acclimatizer. The former proposes
al only with such subjects as have a
tution capable of adjusting themselves to
ircumstances and conditions; and leaves
tter only such subjects to deal with as
that quality, but which he professes to
e to bestow on them by some dexterous
f hand. If those who profess them-
skilled in this wonderful art really can
t to the subjects operated upon a some-
in which they were before deficient,
clearly see what that indefinite some-
is, render it intelligible by means of
ry language, and thus raise it above the
ry of mere pea-and-thimble pursuits.
h a feat as acclimatization be possible,
shew what the means resorted to are, in order to produce that effect. But if it be only a phrase used by would-be philosophic pedants to give colour and form to what is only a scientific Will-o'-the-wisp, cease to use language which, at best, has no rational meaning when so applied, but a direct tendency to mislead the unthinking and unwary. It is of no use, on the part of those who continually use the term, to say that they use it in the same sense as others do naturalization. That is abusing language for no other purpose than to mislead. But if naturalization, pure and simple, be all that is meant when it is affirmed that a plant has been acclimatized, let them candidly avow it, and not attempt taking credit for being able to do what never has been done, nor never in the nature of things can be.

For the benefit of those who have not had an opportunity of observing for themselves, I shall exhibit a very few of the products of acclimatization; and from their characteristics it can easily be inferred how much of this new dogma is a fact and how much a fiction. For a good number of years they have been busy acclimatizing, and still are hard at work; still the fact remains that, year by year, the importation of vegetable seeds both from England and America is increasing, which seems to shew that the process of acclimatization is either extremely precarious or slow, or is it that a retrogression and degradation goes hand in hand with it? or are they merely convertible terms? And, what may perhaps surprise some, the moderate party of this new school, while nominally assenting to its doctrines, are not slow in stigmatizing as worthless rubbish acclimatized seeds of nearly all kinds—saying they are not worth cultivating. And another curious fact, if true, with regard to the orthodox members of this school is, that they are said not to care much about the produce of their own labours for table use, if any better can be had—that is, the produce of seeds recently imported, and that have not been acclimatized.—*Bund Kobee.*

[Conclusion in our next.]

Work in the Garden during August.

From "THE VILLA GARDENER."

AUGUST is the meridian month of our gardens. Now, if ever, the sun of beauty reaches the zenith. Much indeed has been gathered by the way. Every month offers its own harvest to the eye and the hand of the cultivator. But August is a sort of general ripening time of the beauty of the year. All the months as they pass reach forward to this result. And August gone, the glory of the garden begins to fade, and autumnal tints forthwith paint their rich but fading beauty over the hard-working green of summer. Heavy-footed decay follows close on the heels of mellow ripeness and full blossom. The month is a granary, an observatory, and a memento, all in one. While filling our storehouses with its good things, we can hardly help taking stock of the past, and curiously peering forward into the future. August is a proof of past care and the product of invested skill. A lean or empty August is a sign of our neglect, and a memento of our failure. It, to a great extent, reveals the loss or gain of a season. We now begin to reap as we have sown. Skill and attention yield a full sheaf of satisfaction. Ignorance and indifference bring a lean harvest. Though we do not gather all in during the month, we get sample enough to test the quality and weight of bulk. Dwelling among the first fruits, we have time for thought. Though the decay of the cultivator's year is cast past radical change, yet something may still be done to ensure a good late yield of pleasure from our gardens, and more, to lay the plan of sowing wisely and broadly enough for another season. The month gives time to pause over the past, and plan and purpose for the future. Nearly all garden produce has either reached perfection or is pressing forward towards it. The fruit and kitchen gardens are giving us of their abundance of good things. The flower garden, if filled with bedding plants, is without blank or spot of decay. Indeed August is but early summer in this department. The leaves look their best—the flowers their brightest, purest, sweetest, during the month. We have anew a feast of good things garnished with beauty. With grateful and gladsome hearts and willing hands we should do the garden work of the month. Love for the work will make all needful labour light. Those who find gardening a toil and a drudgery had better give it up. They will never succeed. Flora and Pomona only bestow a full basket on those who put their hearts into their work. Love is the golden key that opens wide all the rich stores of the horticultural treasury. None who come without this key can find entrance there, nor go away laden with her good things. Nature's great gateway of happiness can neither be entered by fraud, forced by storm, nor carried by the ungrateful. It is opened wide to the sympathetic and the loving. Her best gifts are free-will offerings lavishly and willingly bestowed upon her votaries. Here, as in other spheres, love begets love, or, what is much the same to us, interprets and reveals it. It is thus that the eloquent words of the American poet Bryant are felt in all their force and beauty by "him who, in the love of nature, holds communion with her visible forms. She speaks a varied language. For his gayer hours she has a voice of gladness and a smile and eloquence of beauty; and she glides into his darker musings with a mild and gentle sympathy that steals away their sharpness ere he is aware."

It is thus that Nature seems to weep with those that weep, and rejoice with those that do rejoice. The fact is, we see, accept, and enjoy it all through the medium of our minds; and gardens are very much to us what our knowledge, culture, love, make them. To some happy eyes any garden seems a paradise. Others see in the best only all the weeds and all the faults; and if there is neither, their jaundiced eyes make them. A lady visitor of this mould was lately walking in a beautiful spot embowered with roses, showering down streams of beauty and sweetness. These excited no enthusiasm; but an unfortunate evergreen oak that had not yet learned to know better than to shed its leaves in midsummer, filled her eye and mind, and gave reign to her tongue in strong condemnation of *the dirty tree.* A word to the wise is enough. If your readers would thoroughly enjoy their gardens, they must have an eye for the flowers, and not look wholly *weedwards*, as if there were nothing beautiful at all. The fewer weeds the better, surely. But the habit of looking at anything on the best side is worth a fortune, and is more or less essential to the full enjoyment of the best garden in the kingdom. Never see a fault but to mend it; and when you cannot do this, don't obtrude it on yourselves and others.

work is to go on smoothly, and garden plea- flow freely without jar or hindrance.

THE KITCHEN GARDEN.

h the planting of all such winter crops as , Brussels sprouts, savoys, borecoles, or kails. inch of ground when cleared of crops should be ly manured, dug deeply, and replanted. Early f cauliflowers, peas, lettuces, and broad beans ow be cleared, and the ground planted with rts, spring brocolis, &c., or sown with winter , onions, or turnips. Ground cleared of early s may be planted with late celery or Walcheren . Sow a pinch of this brocoli seed every three from April to September, and plants will be at hand to furnish any vacant ground. h successional plants, the rare treat of a brocoli, l as the sweetest cauliflower, every day in the ill be secured.

liflower.—Make two sowings of cauliflower the month, about the 10th or 20th, to furnish for standing through the winter under , handlights, or protectors. I have long it best to sow twice and to sow regularly. ower plants are but little trouble throughout nter, and they are wonderfully welcome the ling May or June. At the same time, two or avourite varieties of cabbages should be sown, pinch of red Dutch for stewing and pickling. ages are sown before the middle of August re apt to run to seed. Wheeler's Imperial, g's Queen, Enfield Market, Atkin's Matchless, Pixie, and Rosette Colewort, are good sorts will give satisfaction.

ces.—The brown cos, Moorpark cos, and white winter cos; hardy green cabbage and summer hardy green cabbage, or any other varieties, should be sown on an open space s the end of the month, to stand in the open o be placed under glass in autumn or winter.

ns.—A bed, 4 feet wide, or a few rows to the winter, is needed in many places. The Tripoli, Welsh, and white Lisbon, are the t and best for this sowing.

ach.—Sow several rows of the prickly Flanders ter use, towards the end of the month.

nips.—Sow any vacant ground with the Ameri- l-top stone and orange jelly—both hardy and rts.

shes.—Sow the black and white Spanish and hort-top. The latter, if well watered, will n at once, and the former for winter use. s may also be made of endive, mustard, cress, lad, American cress, &c.

his period of the year, digging and sowing proceed together. The earth has probably rawn dry by the succeeding crop, and all the e it contains will prove too little to start the to growth. Should the ground be very dry, it should be dug up one day and thoroughly watered over night, and the seeds sown on the afternoon of the succeeding day. The worst plan of all is to sow on dry soil and to water directly. On very dry seed beds the seeds refuse to grow at all. When these beds are converted into a puddle, the seeds burst forth at once into leaves or stems, and the latter become food for the first thirsty sunbeam that falls upon them. A mat, or other shading, put over the beds, is a better plan of securing the germination of seeds than an excess of water. The safest place for them would be under Rendle's Protectors, the ends being left out, the glass being painted with whitewash if hot sun prevailed.

Beans and Peas, French Beans, Scarlet Runners.—Advancing crops must be earthed up, soaked with liquid manure, moulded, up and staked. Gather all the produce clean off as soon as they are fit for the table. One pod allowed to ripen seed will take more of the plant that six gathered to be eaten.

Celery.—Deluge the successional crops, and the earliest crops also, two or three days before it is earthed up for blanching. The latter must now be attended to. The best mode of proceeding is to go over all the plants carefully, remove any sucker and small useless leaf, and give the plants a tie together, or two ties, one near the bottom, and a second two thirds up the stem, using thin bands of wide matting. The same or next day, give the plant a thorough watering. On the following or second day after, proceed with the earthing up. Cut the earth down into fine particles from the side of the trench with the spade, and add about 6 inches of earth to the stem. Two or three days afterwards, add six more, and after another similar interval, earth up to the full height, merely leaving the ends of the leaves beyond the earth, and finishing the ridge off as narrowly as possible so as to, throw off all the rain. The reason of the successional earthings is to prevent a too violent shock to the plant. A sudden transition from light into darkness all at once, sometimes provokes a mild fermentation and induces decay.

All winter vegetables, such as brocolis, kail, sprouts, savoys, and summer cauliflower, and autumn Walcheren brocoli, must be well attended to and liberally treated. Manure-watering, surface-scarifying with the hoe, earthing up, and the complete destruction of all weeds, are the chief cultural attentions needed by such stuff during the month. Leeks, lettuces, and endive will grow fast and crisp under the same general treatment.

Onions, Eschallots, Potato Onions, and Garlic will mostly be ripe and fit to gather. It is a good plan to go over onions and bend down all the stiff-necked ones a fortnight or three weeks before harvesting. The back of a garden rake is the simplest implement for the purpose. This checks growth and hastens the ripening of the upper portion of the bulbs. All such bulbs should be taken up carefully without being bruised, laid for a few days on the ground, or, better still, under cover in a shady but airy place, to dry in cool rooms or hothouses. The ripening of onions, which is done by piling them one above the other, with the aid of their withered tops and a strong piece of twine twisted round each tier of onions, thus making a rope of any length firmly bound together, is a convenient mode of storing. But it is apt to bruise the onions, and there is no mode of keeping so safe and simple as one layer deep on a cool shelf or tray.

If the onion ground is heavily manured and deeply dug, it forms a capital place for the spring cabbages, cauliflower, or winter spinach, or Walcheren brocoli.

Ridge Cucumbers, Tomatoes, Vegetable Marrows, Gourds, &c., should have their shoots thinned or stopped just beyond the fruit, and the fruit gathered as it becomes fit for use. All such plants will likewise need watering. With every inch of ground instantly refilled the moment it becomes vacant, a free growth, and scrupulous cleanliness of ground and gravel, the kitchen garden can neither fail to provide plenty or afford pleasure.

THE FRUIT GARDEN.

Protecting, gathering, packing, preserving, arranging, and eating choice fruits are the delightful occupations of this and the following months. The due protection of fruit must be attended to as long as there is anything worth having in the gardens. In growing fruit there are a good many difficulties to contend with—heat, cold, moisture, drought, birds, snails, &c., all enter the ranks against us. But as the fruit approaches maturity, matters become worse. Every thing that flies, or creeps, or runs, seem to be after it. The perfume of ripe fruit makes the vermin mad to possess it; and we have to fight our foes with canvas, bunting, mats, nets, glass, and every other possible or impossible protective weapons. In addition to this we are often put upon the offensive, and have to wage a bitter war of extermination against rats, mice, birds, wasps, earwigs, woodlice, bats, ants, ladybirds, flies, butterflies, &c. By stratagem or violence such enemies must be reduced in numbers or weakened in power, if we are to have any fruit left for ourselves, with the exception of birds, which we must be tender to on account of their usefulness, their beauty, and the sweetness of their song. All the other pests, and the smaller ones of thrip, aphis, red der, should be promptly annihilated. Sulphur or ak the leaves for red spider and mildew; use quassia or tobacco tea, or, better still, an infusion of smelling salts for flies; beanstalks for earwigs, to be emptied into a boiling hot bath every morning; a mixture of treacle and arsenic for ants; of beer and sugar in decoy bottles for wasps, hornets, flies, and butterflies. A double hand glass trap for wasps, and nets or bunting to keep the birds out, or traps to hold them fast in, will hold our foes in subjection, and the fruit safe from their devouring mouths.

Young Wood on Wall Trees.—Attend to nailing and tying in all the shoots, removing any small worthless shoots not needed for fruit bearing next year. Expose the fruits pretty freely to the sun. Stop in all breast wood or current year's shoots, not needed to fill up vacant spaces, to within 6 or 4 leaves of the bottom. These instructions are equally applicable to apples, pears, or plums, on espaliers or cordon wires, as to stone fruits on walls. Morello cherries wanted for dessert, will have to hang long, but will be eaten by wasps unless protected with bunting. Peaches, nectarines, and apricots may be preserved by the same means. A bit of cotton wool wrapped thinly round the fruit bothers the wasps and the earwigs. Figs in the open air must be bagged in muslin as they approach the mellow stage, or our enemies will enter and devour all their substance, leaving us the thin skin for our delectation.

In writing of the preservation of fruit, I ought to mention that many fruits are most effectively preserved on the trees or bushes. The blue Imperatrice plum will hang on the tree till it becomes quite a sweetmeat; and such gooseberries as the red Warrington or currant, and the white or red Dutch, Raby Castle, &c., will keep fresh on the bush till November, if they are now done up in mats or thick canvas. All the breast wood should be shortened back first, and the bushes done up so as to shut out the light and all insects.

Fruit trees, such as plums, peaches, nectarines, apricots, may still be budded. Proceed exactly as recommended for roses (page 116). This is a good way of exchanging good varieties for those that are worthless, and for increasing the number of sorts in a small space. You have, say, one cherry tree. It is large and fruit comes in all at once. Well, bud a few of the branches with other cherries, earlier and later, and from the one tree you may gather cherries for two months or more.

The fruiting canes of raspberries should now be cut out, to give space to young canes, leaving from 4 to 6 new rods of about equal strength to each root or stool.

Attend to the runners of strawberry plants, taking care not to injure their leaves; top dress with a good coating of dung. Now is also a good time to make new plantations as soon as the runners are strong enough. Let the ground be trenched from 2 to 3 feet deep, richly manured. Plant in rows, 2 feet asunder, the plants 18 inches in the rows. New plantations, thus formed now, will bear next year. If a few forced plants can't be secured, the strongest growths must be selected. Forced plants yield runners that fruit more plentifully than any of the current year's runners, however strong. Plant out the first plants from April to June as they come into bearing. With liberal treatment, they will mostly throw a few fruit late in the autumn, and next year the crop is full. We sometimes destroy them after the first crop, occasionally taking a second, which is also good but not equal to the first. After the second crops out-of-doors, the three-year-old plants disappear early to make way for late brocoli. There is no easier nor surer mode of growing strawberries; and many of your readers might have forced plants from nurserymen or market gardeners. Buying such plants we gain a season and double the crop. Weeds grow apace among richly manured strawberry plantations in the autumn. These must be looked after and removed. The best mode of keeping all fruit gardens always neat and clean, is to keep the surface scarified into actual barrenness by hoeing it say once a week. Sometimes moths will form lots ot caterpillars over apples and pears, or mealy bug will spread itself in floury whiteness over apple branches, and brown scale encase pear boughs in its closely fitting shelly coats. The best antidotes for all these are sharp eyes and nimbler fingers to see, seize, and settle them. Cleanliness is the parent of health in all our fruit-gardens. Dirt is not more unsightly than unprofitable.

THE FLOWER GARDEN.

Beds filled in the usual manner will have reached perfection, and the effects of our different arrangements will tell their best tale of beauty for the next three months. Bedding plants seldom grow freely until after the days begin to shorten. When they first go out into their wider world from pots, they seem blinded by the glare and half scorched by the fierce sunbeams. It takes them some time to get used to it, which they seldom do until the turn of the day. As the night lengthens their growth strengthens, and they make rapid progress in the long dewy nights of the latter part of July and August. Leaves, shoots, and flowers try races with each other; and the result is, an abundance of each clothing the ground with fresh verdure, and bejewelling that verdure with the most exquisite colouring.

The ground being now pretty well covered, flower garden plants will need less water. But they must not be allowed to flag for want of it. Remove every dead leaf and flower, and train all the plants in the way they should go, and fix them in their proper places. On ribbon borders each line of plants must be kept straight or regularly curved as the case may be, by the use of stakes, pegs, &c. Nothing looks more unsatisfactory than to see an orderly disposition of plants ruined by a few here and there being allowed to run away out of the ranks. Order is the first law of the grouping system of filling flower gardens, and any departure from it in pursuit of nature's own more free-and-easy style proves unsatisfactory, if not absolutely ridiculous. No one has ever ventured to find fault with mosaics because they were not picturesque; and yet our modern flower gardens, inlaid with many colours in certain artistic proportions, are condemned on account of their uniformness, and found fault with because they do not constitute such a ragged entanglement of light and shadow as would look well in a picture. Make a painting of that smart villa, with its faultless boundary walls, gates, walks, and gardens, all in the best of order and in thorough repair. The picture is a failure. Knock down one of the chimneys, make a few holes in the roof, and break in the walls, and let ivy mantle the ruins. Level the boundary walls; out with the gates, and let starved-looking thorns struggle for life amid the wreck of bricks and mortar: paint all this faithfully, your picture is perfect; but your house is ruined as a habitable dwelling. The same thing is true in regard to gardening. It is a high art, and you cannot always make it picturesque. And in fact there is a great deal of beauty, both in our flower gardens and out of them, that would make but sorry pictures. But surely we may enjoy the beauty all the same, and in one sense all the more, for this very reason. Practically, modern flower gardens look best when there is a place for every plant, and every plant is kept to its place. And this training and fixing of the plants within their allotted areas is an important part of the work of the month. All will not grow alike; and when two or more are used close together, the stronger must be prevented from overrunning the weaker. Some will have to be checked, some encouraged, and a few may need cutting back during the month. Successful gardening is but attention to trifles, and such a trifle as the leaving a flower stem on the end of any decapitated branch makes all the difference in the aggregate mass of beauty.

Cuttings.—It is rather early for these yet, but any atom of choice pelargonium removed either by accident or design should be converted into a cutting on the instant. The secret of fine plants next May is early propagation. No plant is prepared to do battle with the winter unless it is strongly rooted before winter comes. These early cuttings should be rooted on any loose border out of doors. The cuttings will strike anywhere if not coddled nor shaded. Place them firmly in the earth, water the surface, don't shade, and water them when dry, and every shoot will become a plant. Further instructions will be given about striking these and other cuttings in pots next month, which is as early as most flower-gardeners can command cuttings in any quantity.

Water any weak beds well; manure-water hollyhocks, dahlias, asters, stocks, marigolds, zinnias; and, in fact, nearly all flowers delight in such good aids to growth. Strong-growing plants, such as hollyhocks, &c., will require careful tying.

Dahlias will need thinning, staking, disbudding, and shading, where fine flowers are desired.

Roses.—Cut back all shoots that have flowered as soon as the flowers fade. There is yet time for them to break afresh and land flowers safely before the winter. Tea and china roses should likewise be pruned and the cuttings put in in cold frames, and under handlights. It is scarcely possible to have too many of these sweet ever-flowering roses. Hybrid

Perpetual, Bourbon, and Noisette roses will also strike freely now on a slight hotbed under glass. About 6 inches long is a suitable length for a rose cutting. Cut the shoot smooth and level, immediately under a leaf, and dibble it in the ground 1 or 2 inches deep, as you would a cabbage plant. Climbing roses will need tying in, and any excess of young wood removed. To our Banksian roses, if not already done, use a knife or a pair of shears, and remove any superfluous wood, and let no knife touch them from henceforth till next June or July, if you wish for rose wreaths and fine blossoms.

The budding of roses should, if possible, be completed this month, though the buds will take as long as the sap in the bud and stock will run freely. But the question after this is not so much will the buds do, as will they stand the winter?

Polyanthuses and Auriculas may now be divided, replanted, or repotted. Seeds may also be sown.

Pansies.—Cuttings may still be struck, rooted ones planted out, and the last sowing of seed made for the season. Plant out Pink pipings; put in a fresh batch, and layer carnations and picotees. Increase biennials and perennials by seed or division. Divide and replant aubrietias and other spring beauties.

Anemone seed may be sown, as also Intermediate and Ten-week stocks, choosing a light but not too rich bit of ground out of doors.

Keep all beds and borders scrupulously clean. Mow every week with a machine that will box all the grass and carry it away; water the walks in dry weather, and roll them into smoothness a few hours afterwards. Cut edges of beds and walks. Pickle plantains on lawns with a pinch of salt or a single drop of half-and-half vitriol and water, into their hearts, and let order and neatness ever wait lovingly on the Queen of Beauty. And thus can gardens, large and small, become a perpetual fountain that never dries—of gladness and delight to their fortunate possessors.

PITS AND FRAMES.

If *Melons* or *Cucumbers* are grown in glass pits, they will require attention to watering and pinching and keeping up the heat. Water should be wholly withheld from the roots of melons for three or four weeks before the fruits are cut. It injures the flavour and often splits the fruit. Cucumbers, on the contrary, can hardly be over-watered, provided sufficient heat is given. Dung linings—that is, a layer of dung in a state of fermentation about 1 or more feet wide, should now be placed round pits and frames, should the weather prove chilly, to keep up a bottom heat of 80 to 86 degrees, and a surface heat of 70 degrees. Remove all superfluous leaves and shoots from melons and cucumbers. Raise melons off the soil on a tile, slate, or inverted pot or pan. This removes them to a great extent from the attacks of woodlice, and improves their flavour. Cut cucumbers when young and crisp, and keep the plants in free fast growth, and do not allow them to carry too many fruit at once.

Balsams and Cockscombs.—The earliest plants may now be removed to the glass house or sitting-room, and other later ones pushed on.

Pelargoniums will have finished flowering in the glass house. They should be placed for a few weeks out of doors to ripen their wood; then cut them back to within a leaf or two of the old wood, and place them in a cool store-pit or frame to break. When the young shoots have grown an inch, shake the plants out of the pots. Carefully remove with a pointed stick all the earth from among the roots. Cut any unhealthy roots quite away, and shorten in the healthy ones at least one-third, and repot the plant in a pot one size less than the size of the one in which it flowered. The composts prescribed for such plants would fill this number. The simpler, however, the better. Four parts of turfy loam, one of peat, one of dead leaf mould, and a fourth part of sharp silver sand is as good or better than any of them. Place 1½ inches of broken potsherds in the bottom of clean pots; over them a thin layer of rough coco-nut fibre. I prefer this to moss. Then a few morsels of the roughest portion of the soil. Hold the plant loosely over the pot with the left hand, allowing the longest roots only to touch this base line of soil; with the right add the soil to the roots, which must be equally distributed throughout the pot and among the soil. As the work of potting proceeds, the plant is gradually lowered as the filling goes on, until the collar—that is, the point of junction between the earth and the air—rests almost an inch below the rim of the pot, when the work is finished. The soil must be pressed firmly with the fingers and thumb in potting, and finally consolidated with a sharp rap on the bench as the finishing stroke. Remove the plants back to the pit, and settle the roots in the open soil with water sufficient to go right through the whole of the earth. Keep the pit pretty close and moist until the plants begin to grow. But beware of watering the roots a second time until they have used up the first lot. Wounded roots in fresh quarters do not drink much at first, and it is certain weakness if not death to newly-potted plants—to souse their new food with an excess of water. When root and top are once more in lively exercise, more air and water must be given. The happy medium aimed at should be a healthy free start, without weakening the plants by coddling.

Cuttings of pelargoniums, fuchsias, petunias, &c. &c., may also be struck now, and potted off as soon as rooted.

Seedlings.—Cinerarias, calceolarias, Chinese primroses, &c., may be shifted into larger pots.

Sow *Mignonette* in pots for winter flowering. Also choice auriculas, polyanthuses, and heartsease. Choice varieties of the former grown under glass should now be shifted into larger pots. The best soil is loam and dung laid up together for two seasons, in the proportion of two parts of loam to one of good farm-yard manure, to which should be added a sixth part of sand.

Cuttings of verbenas, petunias, ageratums, anagalis, centaureas, coleus, &c., &c., may now be struck in pits and frames, where large quantities are required. A few bushy coleuses and Iresines grown here will be found useful for the green-house and sitting-room by-and-bye. Zonal and variegated pelargoniums in pots for autumn blooming do better for the present in the open air than with the shelter of glass.

THE GLASS HOUSE.

Remove such plants as heaths, ericas, epacrises, where such are grown, out of doors for a month or two, if not already done. Finish fresh potting azaleas: camellias, cytisuses, coronillas, if they require it. As soon as azaleas and camellias form their buds for next year, place them outside in a shady place. See that the pots are stood on a worm-proof bottom, and that the tops are secured against being blown over.

The space thus cleared within the house may be filled up with balsams, fuchsias, achimenes, zonal and variegated pelargoniums, coleuses, single and double petunias, Humea elegans, or any other plants with beautiful flowers, or graceful or high-coloured leaves. Avoid overcrowding; keep all scrupulously clean, and prevent the climbers, if any, from bearing a tangled maze of inextricable confusion, without, however, tying them into bundles of ugliness, or robbing them of their easy gracefulness; and the glass-house will not fail to interest and please, though it may be in some danger of being eclipsed by a richer profusion of beauty outside. The greatest danger in the summer furnishing of glass-houses is that of filling them with the same sorts of plants as we use outside; thus making another garden of the same character, but smaller and worse. Now, whatever else it is or is not, this one thing its occupants ought to be viz., distinct from, and better than those in the garden outside.

The Apiarian.

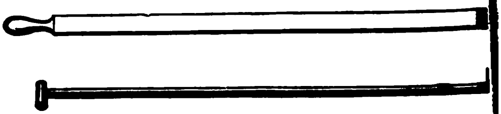
THE BAR-FRAME HIVE.

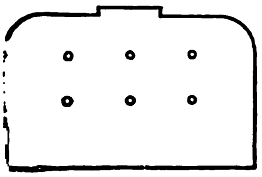
DO you approve of this hive? No, for it is very inconvenient, clumsy, and expensive. We do not see one feature in a bar-frame hive which will commend it to an experienced bee-keeper, whose object is honey and profit. We believe it will soon go into disuse. We would abandon bee-keeping for profit if we were compelled to use hives filled with bar-frames. They would be a perfect nuisance to us. But are they not useful to some bee-keepers who like to get a bar of honeycomb now and then? Perhaps they are; but anybody may get honeycomb from a common hive more easily than from a bar-frame one. By using comb knives, he could cut out of a common hive 2 lb., or 4 lb., or 6 lb. of honeycomb about as soon as he could unscrew the lid or top of a bar-frame one.

Here are two tools used for cutting combs out of hives, and which are exceedingly handy when we want a few pounds of honeycomb. They are useful on more occasions; but they are introduced here to the notice of the reader, merely to let him see that moveable bars in a hive are not at all necessary for the purpose of obtaining a comb of honey.

The broad tool or knife is simply a piece of iron or steel, with a chisel end, for cutting the combs from the sides of the hive, and for splitting them elsewhere. The other is a rod of steel, rather more than a quarter of an inch thick, with a thin blade at the end [illegible] and [illegible] edges sharp—[illegible] combs [illegible] top of the hive [illegible] knife should [illegible]

But do you not consider a bar-frame hive very useful to the student of bee-history? Yes, very; for he can take out a bar of comb and examine the brood in it daily, or as often as he chooses. The bees do not always make their combs in the line of the bars; and when they do so, the bars are not moveable without great sacrifice. And while the combs in a bar-frame hive are not wholly made, it is rather dangerous to move it, for there are no cross-sticks in these hives to steady and support the combs. Till the combs reach the bottom, there is great risk in moving these hives. A slight shake or blow may cause all the combs in them to fall down in confused masses. Woodbury's bar-frame hive is made principally of straw, and is therefore incomparably the best of its kind. Now, in common hives, cross-sticks are used with great advantage and safety. We use five or six in every hive. These cross-sticks go from side to side, and, by the use of guide-combs, the combs are made to run from front to back, so that every comb is well supported.





Before the combs are well started from the crown of the hive, they are securely fastened to the top centre stick; and as they are enlarged they are cemented to the other sticks. The bottom sticks should be at least 4 inches above the board, for, if less than 4 inches, the bees sometimes do not close their comb round them.

The Dairy and Poultry-Yard.

ON SOME POINTS IN BUTTER MAKING.

[Concluded.]

AS already stated, the temperature at which the milk or cream should be churned is a point of much importance, from 60 deg. to 62 leg. being the best. The butter is injured if the emperature is above 64 deg., and if it falls below 55 deg. it is very difficult to make the butter come. The condition of uniform temperature at all seasons being thus seen to be essential, the modes of securing that uniformity of temperature vary with the season. In summer, the use of a flowing stream of cold water is much in vogue in some places, especially in the factories of the United States. Ice is also used. A good deal depends upon the construction of the dairy-house itself. This should be so situated, if at all possible, that the direct rays of the sun—at least at the hottest part of the day—should not fall upon it. The walls should be, if possible, double, as also the roof, and double windows should be adopted. In winter, when artificial heat is used to keep up the temperature, these structural arrangements, useful in summer, will then also be useful, as tending to reduce the loss of heat which then comes from the interior. The best mode of keeping up the temperature of the dairy is the employment of hot-water pipes. The heat by these is easily regulated, although there are some forms of stove now introduced by which a uniform temperature can be maintained at small cost.

We have already adverted to the question of quick and slow churning, on which we have not hesitated to express our belief that quick churning is not the point desiderated. We believe that the best butter is obtained when the churning takes a moderate time; to us, therefore, one of the many churns which are advertised as producing butter in "five minutes," or "less than no time," possesses no charms. The varieties of churns are very numerous; their name, indeed, is legion. Of the old fashioned churns, the best is the barrel, after that the plunge, or piston churn; of the new we prefer Anthony's American Dasher Churn, made by Burgess & Key, of London. It is scarcely necessary to say that it is essential to have the churn, like all the other dairy utensils, scrupulously clean. To secure this it should be washed in boiling hot water after being used, and thoroughly dried before being put away.

To secure the best butter it is necessary to churn frequently. This is often neglected, and the cream kept too long, this being done in order "to save time," in churning a large quantity at once. Better far to churn a small quantity at a time, and thus get the best butter. Cream kept till it is decomposing, or even approaching decomposition, cannot possibly give good butter; certainly not the best. Still it should be kept, in the opinion of some, till it is "cauved" or "soured; in the opinion of others, it is best churned sweet. On these two opinions much can be said *pro* and *con.* We always sour our cream, and we may say that the butter could not be surpassed for firmness and perfect sweetness. No doubt a great deal depends upon the quality of milk and other things being equal. This can be secured by arranging the filling of the cow-house or byre with a regular succession of fresh calving cows. A little management will secure this.

The washing and making up of the butter greatly affects the quality of it. The purest water should be used for the washing; and although mechanical aids are now offered for hastening the process, we adhere to the old fashioned hand-washing as the best. There is no mechanical appliance which can match the human hand for manipulating butter. The great point to aim at is to wash the milk thoroughly out, or if this is not done the butter will not keep. In no part of butter making is the skill of the dairymaid more required than in the "making up."

The Country Gentlewoman.

THE PARLOUR GARDENER.

CHAPTER IV.

THE FLOWER-STAND GARDEN.

Manner of keeping it—Plants bought in Bloom—Plants to cultivate on the Flower-stand—Climbing Plants—Passion-flower—Mandevilla suaveolens—Wood Pink—Thunbergia alata—Climbing Double Violet—Plants for the Middle Part of the Flower-stand—Camellia—Mignonette as a Tree—Necessity of loving Flowers in order to take good care of them.

A FLOWER-STAND is a very pretty piece of furniture, which may be a little more simple or a little more ornamented, according to the degree of simplicity or elegance of the furniture around it, with which it should harmonize. It makes a necessary part of that furniture. There are two different ways of making use of it; these must be considered separately. If you merely wish flowers while you can get them from the gardeners, agree with a gardener by profession, and he will keep your flower-stand furnished at all seasons with blooming plants. Your care will be confined to watering them and keeping them free from the dust. You will enjoy them; but they will not be your work.

You will do better than that, if, having the leisure, you have the will also, to give assiduous attention yourself to the cultivation of the plants that are to adorn your flower-stand. I imagine this to be the case—that you are disposed to take a little of that trouble which is a pleasure, and to make of your flower-stand a real garden of your own. We will begin, if you please, in the month of November—at the time when the fall of the leaves brings back to the cities those who have passed the fine season in the country.

Climbing Plants.—Choose a flower-stand as large as the space you have to give it will allow; keep it constantly with one side against the wall, so that you can put into it a trellis, shaped like a fan. The first thing now to be done is to cover this trellis with climbing plants: they will not be the least interesting part of this miniature flower garden. Plant a passion-flower, as the principal ornament of this trellis; let it be as wide and as high as it may, the passion-flower will soon cover the greater part of it. You must add to this a somewhat rare plant, the Mandevilla suaveolens, and a very common plant, the wood pink. These three plants—the passion-flower, the Mandevilla, and the wood pink—bloom principally at the top; and that the whole trellis may be ornamented equally with flowers, plant at each end a Thunbergia alata, and in the middle a double violet.

The Thunbergia lays holds of anything that is within its reach, without ever rising very high. It becomes covered with charming flowers, of a fine nankeen yellow, set off with a black spot in the middle. You find it, as well as the passion-flower and the Mandevilla, at all the nurserymen. The price of these plants is never very high, and they accommodate themselves very well to the artificial climate of an inhabited room. Take good care not to buy them in bloom, even though you should be able to get them in full flower; take them at most in the bud; it will be much more agreeable to make them bloom yourself.

Climbing Double Violet.—Possibly you may never have seen a violet climbing on a trellis. The culture of the double violet in this form is very common in Belgium and in all the north of France. It is not difficult.

The double violet produces naturally, every year, a certain number of runners, like those by which the strawberry is propagated. Attach to the trellis those runners which are so situated as to be able to take hold of it easily, and destroy all the others. The tufts in which each runner terminates will flower abundantly in this position. After they have bloomed, other runners will come out, which you must attach to the trellis as you did the first; so arranging them as that they shall not take possession of the space reserved for the other climbing plants. By this system, continued for some years (time is necessary for every thing in horticulture), the runners which have been raised and attached to the trellis will become nearly woody; and every year, from the end of winter to the middle of spring, you will be able to gather from them a profusion of forced double violets, whose fragrance for you will far surpass that of the violets forced by the gardener, and which he makes you a present of—for your money.

Plants for the Middle Part of the Flower-stand.—The middle part of the flower-stand is yet empty. To fill it well, place in the centre a fine camellia; a Donklarria; or, if rose colour be a favourite of yours, a Marchioness of Exeter; if you prefer white, an alba flore plena, a fimbriata, or an ochroleuca. There are at least five or six hundred kinds of camellias, with flowers very different from each other. Make what choice you please; only avoid taking for your flower-stand a plant that is inclined to grow too tall; it will injure the ornamental effect of the occupants of the trellis.

Management of Camellias.—When you buy your camellia, it should be full of buds that have attained to about half their size. If there are too many buds, above all if there are two or three in a bunch close together, you must not hesitate to sacrifice a portion of them. But, as the very short stem by which the flower bud of the camellia is attached to the branch, is precisely the most delicate part of it, unless you observe great caution in detaching the superfluous ones, all will fall, one after the other, and you will not obtain a single flower. Happily, it is easy to avoid this annoying result. With a very sharp penknife, cut off, horizontally, the upper half of the buds which you do not wish to preserve, taking care to shake the plant as little as possible, and especially not to touch the bud stems. The remaining half of those buds will very soon fall of themselves, without occasioning the fall of the entire buds. These will bloom perfectly a month or two later. Moreover, take care not to water your camellia with water that is too cold. This injunction is so important, that I am not afraid of repeating it too often. Should its vegetation seem to you not vigorous enough, give to it, now and then, half a tumbler of the water that the dishes have been washed in. Frequently wash and wipe its leaves on both sides. Do all this, and it will bloom as beautiful in your flower-stand as if it had never quitted the greenhouse of the nurseryman who sold it to you.

Some pretty plants of Erica (cape heath), of the medium size varieties, and one or two pimeleas—one with a white hanging flower, the other with a rose-coloured upright one—will complete the filling of the flower-stand.

Mignonette as a Tree.—Do not fail to reserve, at each end, a little place for a plant of mignonette as a tree. You have probably never seen mignonette otherwise than in the ordinary form of an herbaceous plant; and, as you do not live in the north of France, where these pretty shrubs are very much in fashion, it will be difficult for you to procure two tree mignonettes already formed. You must, therefore, form them for yourself, and if you refer to page 98 of THE VILLA GARDENER, you will there find full instructions how to proceed.

Ornamented and managed as I have directed, your flower-stand will be a continual source of agreeable recreation. There will always be work about your plants. The pleasure of providing for their wants will be as agreeable to you as that of seeing them flower, one after another. Their bloom will be the fruit of your own labour; it will have been merited by the act of cultivating them. They will have for you a hundred times the value that the most beautiful plants would have which you bought in bloom from the nurseryman, and replaced by others without your having a hand in producing them.

Moreover, young ladies, besides the plants with which I have just advised you to adorn your flower-stand, you have an immense latitude and many resources—unlimited, I may say—in the many varieties of the different species of other plants, equally worthy of your care. As I shall, in the course of this treatise, when engaged upon the subject of multiplying and cultivating plants, have occasion to make special mention of those just referred to, this need not be done here. I shall take care to make you acquainted with such as would figure to advantage in the flower-stand of your apartment; which, if its situation be favourable enough, may form a companion to the garden on the mantel-piece, in addition to the garden on the *étagère.*

And pray observe, mothers—to you do I now address myself—that flowers are like children; in order to bring them up well, you must love them. If there be among you any who do not love flowers enough to bestow upon them the attentions that they require, neither the preceding counsels, nor those of the chapters which are to follow, will be intended for any such.

WARNING WORDS ON WATERING.

NEVER give water to a plant or plants when the soil in which they are growing is wet enough already. Don't water on any given day, whether that be once, twice, or thrice a-week. Avoid bedewing, or sprinkling the surface, when the soil of the plants is dry. Don't water when the sun is high in the horizon. Don't use the water-pot on the eve of a cold frosty night. Don't, as a rule water plants overhead, over the foliage, in cold frosty weather. Never let a drop of water touch the flowers when they are in the height of their beauty.

Only use guano water, or other liquid manure, when you are told to do so. Don't spill water on the paths of your greenhouse when the temperature is low. Don't use water at a temperature of 36 deg., in a house with a thermometer at 50 deg. Don't water with a rose on the watering pot in any cool temperature house during the winter months.

Don't use pot flats or saucers for holding the moisture drained through the balls of earth in winter, unless in very warm rooms.

The use of the watering-pot.—When water is given let there be so much as to permeate the balls of earth within the pots. Let the earth or soil be rather dry when you repeat the dose. Give freely on the return of light and heat, as the plants grow and drink it up with avidity. Give to bulbous plants, such as hyacinths, a much greater quantity than to ferns, or even mosses, or beautiful foliage plants, or annuals, such as wallflower, gilliflower, mignonette, and such like favourite window plants. Moisten the plants, leaves, and branches, with a syringe, on the return of spring, somewhat copiously. Do this on the evenings of bright days, and the dewy freshness of out-door beauty will be apparent in the morning.

THE

NTRY GENTLEMAN'S MAGAZINE

SEPTEMBER 1870

AGRICULTURAL MATTERS IN OLD TIMES.

direct attention to an article in another page (p. 172) under the heading the Tombs," in which our readers some curious and interesting infor- bout the agricultural food of Lon- icularly, and incidentally about the gricultural condition of the country st century.

12, the subject of the enclosure of ds, with a view to their reclamation, pying the attention of Parliament, facts recorded in the article were got a view of shewing the necessity of g the area of cultivable land. It thought that 2,221,951 qrs. of corn too great a quantity to import from and that more than £8,000,000 which was the sum paid for the im- £3, 12s. 6d. per qr., was by far too pecie to send out of the country. difference from our imports at the time! In the five months ending year, we imported nearly 12 million vheat, 3¼ million cwt. of barley, and ion cwt. of oats, or, in round num- ,000,000 cwt. Thus, supposing the tion to go on in the same ratio ut the year, they would reach a well on to 45 million cwt.

e interval between 1700 and 1812, nprovement had been made in the nd modes of fattening cattle and s indicated by the difference in the weight of the animals killed. In the former period cattle weighed only, on the average, 370 lb., calves 50 lb., and sheep 28 lb.; in the latter they had risen, oxen to 800 lb., calves 140 lb., and sheep 50 lb., an increase of more than a-half in both cattle and calves, and of nearly a-half in the case of sheep. The cattle slaughtered in the London market were averaged, in 1808, at £20, sheep and lambs at 40s., calves at 50s. each, and pigs at 45s. The value of butchers' meat consumed in London at the date mentioned, taking it at these prices, amounted to £5,264,742, 10s. What a difference between this and the immense consumption now!

At the time we are writing about, milkmen did not appear to be much better thought of than they are at the present day. The cow with the iron tail was as prolific as she is said to be now, and always yielded more freely when the customers were most numerous. We are informed by the old chronicler that "When the nobility and gentry are in town for the winter season, deterioration of milk is at the highest; during the summer months, when such families are mostly in the country, it may probably be of rather a better quality." The farmers and dairymen are freed from any blame in the matter; the complaints as to deceit and greed being made entirely against the retail dealers. It is said "the milk is always given in its genuine state to the retail dealers (which is more, we are afraid, than could be said now), and is sold to them under 2½d. per quart, for which they obtain 5d. This profit is surely large enough to prevent even the smallest incitement to adulterate it, and much is it to be lamented that no mode has been yet devised to stop the many impositions practised in the sale of this necessary article of life."

While the retailers of milk are thus accused of being the adulterators, the adulteration of bread, which at that time was also prevalent, was transferred from the shoulders of the bakers to those of the persons they dealt with, or mealmen, as they were called. The bakers do not appear to have been in very flourishing circumstances. We are told that "very little of the best flour is sold alone. Most of the bakers are in debt to the mealmen; they have not the power to choose the best, but, at equal price, are compelled to take seconds, and in many cases such a mixture as the mealmen may think fit to offer. There are persons who suppose that the adulteration by mixtures of various kinds of meal, even beanmeal, forms the greatest part of the mealman's profits; as it is notorious that the mealmen buy different kinds of grain, and that a large proportion of the bread sold as the best wheaten bread in London is at least at one assize, or 2d. in the peck-loaf, under bread of that quality." Unfortunately, the practice of adulteration of bread is still common, and more deleterious substances than inferior and different kinds of meal are used in the adulteration.

It will be noticed that the area of England was then given at more than it is reckoned at now, the total area utilized, as it may be called, being estimated at 32,027,000, and the common and waste lands at 14,889,000, a total of 46,916,000 acres, whereas now the area is estimated at 37,325,000, of which there are in crops 25,900,000 acres, 71 per cent. in England, and 53 per cent. in Wales. The acreage in wheat then was very little less than at the present time, being 3,160,000 acres as against 3,417,000 last year. It will be noticed, however, from the table, that potatoes do not figure at all as an article of cultivation, while last year 357,000 acres were under this crop, and that 17,500,000 of acres were depastured with cattle. There are other items of interest in the extract which space prevents us from particularizing here, but our readers will notice these themselves.

HOW TO MITIGATE THE EFFECTS OF DROUGHT.

THE *Journal Official de l'Empire Francais* contains, in a recent issue, an ordinance of the Minister of Trade and Agriculture urgently requesting the prefects of different departments to call the attention of agriculturists to the subjoined report, drawn up at the solicitation of the Government, by Prof. Heuzé, inspector of agriculture, and teacher [illegible] Agronomic School of Grignon. It is [illegible] follows:—

During the last few days I have had occasion to traverse many departments of France, and regret being compelled to report most unfavourably as to the effects of the drought. The latter has lasted more than two months, and can only be compared in severity with that of the spring of 1681—a year still memorable in the annals of agriculture.

For twenty years past the advantages attendant on deep cultivation has been constantly expatiated upon, and this year the beneficial effects of the system are strikingly apparent. In those localities in which the subsoil plough has been judiciously and persistently employed for any considerable length of time, the crops are now suffering far less from the drought than in those districts in which farmers have not resorted to it. The winter crops (rape, winter barley, winter vetches, rye, wheat, and winter oats) look, omparatively speaking, much better than the orage ones, although they (the winter crops) have also suffered from the oppressive heat which has prevailed since April.

The extraordinary short supply of green food continues to be a cause of great anxiety to the farmer, and should the drought last much longer, it will become a serious question how to keep the stock alive from day-to-day.

Amongst the measures which may be easily and advantageously resorted to with a view to mitigate the effects of the long protracted dry weather, I would venture to suggest the following, classifying them under the heads, summer keep, autumn keep, spring keep, litter, manures, purifying water.

SUMMER KEEP.

Maize or Indian corn may be sown as late as the end of July, or even the beginning of August. Care should be taken, however, to select a quick-growing variety. In order to accelerate the germination of the seed, it is well to steep it for 48 hours in water, and it should then be sown towards evening, three or four grains in a place, about 3 inches deep, and in rows 12 inches apart—seed per acre 4½ bushels. As a surface crop, Hungarian melia 2 3-5th lb. per acre, millet, 3½ lb., and Tartarian buckwheat, 4½ bushels, will be found a useful mixture, and should be lightly buried by means of the harrow and roller.

Although buckwheat is but a second-rate forage crop, it has this in its favour, it is able to withstand drought, and serves to shelter other plants during the period of their growth.

As regards maize, although it cannot make rapid progress in a time of drought, it will at least germinate and keep growing. The seed put in during the dry weather will be found considerably in advance of seed which has been kept back to be sown after rain.

In order to secure a succession of green food, it is advisable to sow the above mixture (of millet, melia, &c.) at intervals of eight days. Thus will be obtained a nutritious and palatable fodder for live-stock of all kinds.

The common nettle is an excellent food for cattle and pigs. After being cut it should be allowed to wither in the sun for half-a-day, in order that it may lose its pungent properties before being given to the stock.

Cattle should only be driven to pasture in the woods either in the morning or evening; during the heat of the day they would be tormented by insects. Pasturage situated in red beech and horse chestnut woods, is not so good as that under oaks, birches, white beeches, elms, and alders.

AUTUMN KEEP.

In Alsace, Auvergne, Limousin, and Anjou, the turnip is regarded as one of the ordinary farm crops; but whether it can be grown this year without a change in the weather, is very doubtful. In any case, an attempt should be made, and to protect the roots, in some measure, against the dry heat, a surface crop of Tartarian buck-wheat might with advantage be raised. Four to five bushels of buck-wheat seed per acre should be harrowed in first, and then 2½ to 3 lb. of turnip-seed. The buck-wheat will protect the turnips against the fly, as well as against the sun's rays. Let the buck-wheat be cut with the sickle in September or October—even if the grain is then only half ripe—care being taken not to damage the turnip leaves. Should the weather be fine, it can be dried and carried. It makes a good winter keep for cattle and sheep. The turnips may be left till November. Early kinds of turnips should be sown not later than the 25th of July; late varieties (Navet Coule d'Or, N. Turnep, N. Blanc Plat Hatif) up to the 20th August· White mustard (Sinapis alba) is a crop the value of which has been nowhere properly appreciated. It may be sown broadcast, 11 lb. per acre, from mid-August to mid-September, and will soon appear above ground and grow rapidly. It should be mown whilst in bloom. In some localities it is known as the butter plant (Plante au Beurre).

Vine leaves are a somewhat acid, but at the same time nutritious, and refreshing green food. In Languedoc, sheep are allowed to eat them off the plants, and the vineyards are not found to sustain any damage in consequence. After harvest, the branches which have been chopped off the vine can be tied up in sheaves or bundles, and given to sheep and horned-stock in racks.

Acorns, beechnuts, and chestnuts, are also worth collecting this year, and may be used as food, either fresh or dried. If intended to be given in a dry state, they should previously be crushed and steeped in water. Cattle and swine are very fond of them.

WINTER KEEP.

Gorze will grow everywhere in France, except on chalk soils. It still covers large areas in Sologne and Brittany, and in the last named locality the young shoots of the plants are frequently used as fodder for horses and cows. Where the gorze is cut every year, and grows thickly, the scythe is the implement used to cut it.

In the case of old and detached plants, however, the shoots are best cut off with a sickle—the left hand being armed with a leathern glove or wooden fork. The whin before being given to stock should either be bruised in a trough or cut by a chaff cutter, and then, after remaining some time in water, be crushed by a wooden pestle in order to destroy the thorns. A machine exists for combining the above manipulations, and is workable by hand. The green shoots of gorze thus prepared make a capital fodder.

The Jerusalem Artichoke (Helianthus tuberosus) is extensively grown in many of the central and western Departments. The root of the plant—besides being useful as an article of diet for man—forms a wholesome food for neat-stock, sheep, and swine, and the leaves, when dried, may also be given to the flock. In the later case, the stalks should be cut in autumn, lightly tied together, and placed upright in the field. As soon as dry, they may be stored away in an airy shedding or barn, and given to the sheep in racks during winter.

Oat and wheat straw, though, comparatively speaking, inferior feeding materials, must this year be turned to account. After they have been cut into chaff their feeding value can be greatly increased by steeping them for 24 hours in water sweetened with molasses. One kilo. (2 lb. 3 oz.) of sugar-beet molasses suffices for 100 litres (22 galls.) of water. If molasses are not obtainable, they may be replaced by rape or cotton cake. Though an animal cannot, of course, be fattened on this food, it may, at least, be kept alive; for straw, treated in the above way, becomes not only more digestible and nutritious, but also more palatable, and is readily eaten by live-stock. A little hay can at each meal be added to the animal's rations.

The leaves of certain trees also contain so much nutriment as to render them valuable substitutes for hay. In Anjou and Franche Comte, they are regularly collected. The leaves of the lime are rich in nitrogen, and those of the white thorn and elm will keep well. According to Olivier de Serres, the foliage of the poplar may be regarded as the choicest item on the farm animal's bill-of-fare. Sheep thrive well on the leaves of the birch. In Dauphine, in the Cevennes, and in Lower Languedoc, the leaves of the mulberry are every year carefully collected and dried; the young shoots are cut off, ¾ to 1 foot in length, dried in the sun, tied into bundles, and stored away under an airy shedding.

SPRING KEEP.

As the land sown down this year with clover, lucern, and sainfoin has mostly failed to produce a plant, it will be advisable not to break up the old fields still under those crops. In order to render them as productive as possible in the spring, let them be well harrowed in the autumn and sown with ray-grass. The latter will not be injured by the frost. Ray-grass or winter oats may also be added to the Trifolium incarnatum, which is sown in August or September. A mixture of rape or turnips and rye will yield an early supply of green food. It will be ready for cutting by the end of March.

LITTER.

There will be no superabundance of straw this year, and in its place can be used as litter, sedge, reeds, heath, dry earth, and leaves, all of which should be brought under cover before winter. They may be allowed to remain down as litter somewhat longer than is usual in the case of straw. When removed to the dung-heap, some slacked lime should be added to them. In the Department of Somme, dry turf is used instead of straw.

MANURES.

On most farms dung is not treated in the most rational and economical way. In order to preserve its fertilizing properties, it should be covered with 8 to 12 inches of earth, and moistened with liquid manure or water. As there will be great scarcity of dung next year, it may be useful to farmers to know that Messrs Albert, of Moulis, near Castelnau (who, in 1867, were awarded the prize of honour for the Department of Gironde), prepare every year a large quantity of manure in the following manner:—

To 15 hectos. (41¼ bush.) of night soil, they add 100 kilos. (1 cwt. 3 qrs. 24 lb. 7 oz., or nearly 2 cwt.) of sulphate of iron; 10 kilos. (22 lb.) of ammonia; 200 kilos. (3 cwt. 3 qr. 21 lb.) of poultry droppings; 3 hectos. (8½ bushels) of lime; 150 kilos. (2 cwt. 3 qr. 22 lb. 11 oz., or nearly 3 cwt.) of sulphate of lime; 250 kilos. (4 cwt. 3 qr. 19 lb. 4 oz.) of wood ashes; and 1 kilo. (2 lb. 3 oz.) of sea-salt. All these materials should be dissolved in 100 hectos. (1 cwt. 3 qr. 24 lb. 7 oz.) of water, and when the ley is ready for use it is carefully poured over layers of previously cut heath as fast as the latter are piled above another into a heap on some elevated level ground. After a very short time the heap begins to ferment, and to emit the same smell which proceeds from farm-yard manure. The manure thus prepared is excellent, and fetches 1s. 3d. a lb.

As regards the method of purifying water, touched upon by Professor Heuze, it will scarcely possess sufficient interest for the reader to justify its being described here. It is worthy of mention, however, that many of the farmers in the Department du Nord have systematically watered their fields during the late dry weather. In Marny, a 6-horse power engine, with a consumption of 17 bushels of coal, has watered 2½ acres a-day (day of twelve hours).

The pump in use is a portable centrifugal one, and the water is obtained from wells, of which there are a number in those districts where the cattle remain out all the year through.

WASTE OF WATER—HOW TO SAVE IT.

THE effects of the late heavy rains we experienced some two or three weeks ago have now entirely disappeared, and again the grass and green crops are suffering severely from want of water, and in many places man and beast also. In numerous country villages the drought is so great that a halfpenny and a penny for a pailful have been paid by those who can ill-afford to disburse a farthing for this usually plentiful and free necessary of life. And the water they get by paying for is by no means so wholesome as that which, in ordinary seasons, they get without money and without price.

Under these circumstances, Mı Bailey Denton thinks it is the positive duty of every one to do his best to fix on the public mind the deprivation from which the poorer classes are suffering in many hundred villages from want of water. We cannot do better than give Mr Denton's ideas and suggestions on this, at present, all-important matter in his own words:—

It is true that our present condition is very like that of 1868, with this difference, that the present drought commenced earlier in the spring, and has been relieved by frequent though partial storms, which were absent in 1868. This difference, however, affords very little satisfaction to those who are watching results. Storms really afford but a poor supply of water unless tanks are prepared to receive it, and means are taken to collect the rain in tanks. The heaviest rain is swallowed by vegetation, or returned to the atmosphere very shortly after it falls; and as we have yet to endure, very probably, two or three months of scarcity and heat, I wish to point out to the wealthy and influential that in the frequent storms that occur we have a source of supply to the rural poor if the owners of cottages will only provide underground tanks to receive all the water to be collected from the roofs. An ordinary cottage, with its little outbuildings, covers rather more than three poles of ground, and ½ an inch fall of rain in that space will provide 1 ton, or 225 gallons, which, with the frequent recurrence of storms we are now experiencing, would keep the cottager's family supplied. At present I know of many poor men who are paying out of their meagre wages 1d. a-day for water—*i.e.*, ½d., and sometimes 1d., per pail of 3 gallons. Upon these *data* a storm of ½ an inch rainfall would be worth 5s. if it were conserved for use.

It is not a fortnight since that I found sheep dying in considerable numbers on Romney-marsh from the want of water and food. The pasturage was scorched and the ditches were empty. But it must not be thought that the dry condition of the grass was the cause of the fatality, for it is well known to practical observers that scorched and bare pastures will maintain life with extraordinary tenacity if they be associated with good water.

In Romney-marsh the provision of this essential of life is a matter of the utmost simplicity, if made at the right time and by connected operations. Moreover, villages for many miles round might benefit by the operations, for water of the purest character might be obtained. At present the inhabitants are obliged to resort to surface ponds, in which the sewage of farm-yards and the village street is collected.

But the benefit to the locality would not end here. It is well understood by the best farmers in the Marsh that a large number of sheep are killed by rot in wet winters, caused by excess of water,—the very excess which would save life and prevent disease in seasons like the present.

Surely the time has arrived when some compulsory action should be taken to secure at least the improved sanitary condition of villages, even if we leave the sheep to die in winter from rot, and in summer from starvation.

INCENTIVES TO THE IMPROVEMENT OF AGRICULTURE.

OUR cousins across the Atlantic are fast following in our wake in the way of agricultural improvement. Indeed, it may be said that, in many respects, they have outstripped us, especially in the way of mechanical invention. So far as reaping machines are concerned, the Yankees, although they did not take time by the forelock, had shrewdness enough to take advantage of the brains of a Scotchman, the Rev. Patrick Bell, and turn them to uncommonly good use, not only in their own country, but in ours. Ever since the unfortunate war in the time of our long-lived George III., our rivalry has been, not in war-ships nor fire-arms, but in the realms of peace. We have struggled hard since the Great Exhibition of 1851, in trying to get ahead of each other in the peaceful arts, and have left others to devote their attention specially to arts of war—which devices never can make, but may unmake the prosperity of a nation. But while ever anxious to beat our swords into ploughshares and our spears into pruning-hooks, we never neglect such preparations as are necessary to secure our safety and maintain our honour. Our great ambition, however, is not in perfecting means for prolific bloodshed, but in perfecting all kinds of implements and machines which secure that man's blood will be made and saved at the least possible cost.

We do not grudge our American friends the success which they have obtained in the manufacture of various mechanical contrivances for the saving of labour on the farm. On the contrary, we rejoice in it. While claiming that the germ of several ideas in connexion with advancing agriculture belonged to this country, we willingly concede to them the merit of having first worked them out to general and practical effect.

Long may we continue to emulate each other in the Royal and Highland Agricultural Societies' Show-yards! The competitions there have been so keen and so close, and have tended so much to the improvement of any little defects in form, construction, or substance, which originally existed, t may now almost be said, with reference ıping-machines, that they have reached :tion, so far at least as that is possible inquiring age—

Men, my brothers, men, the workers,
Ever reaping something new:—
That which they have done but earnest
Of the things that they shall do."

the best makers may win in these com- ons is, we believe, the hearty desire of ompetitors; and each and all, we doubt will take, to use a sporting phrase, any "tip" necessary from a rival.

e foregoing remarks seem rather a round- :, but we do not think quite an *in- pos* way of drawing attention to a ›n of the prospectus of the New York Agricultural Society's thirteenth show, ı commences this year on the 27th Sep- :r at Utica. Following the footsteps of the :r country, the prizes offered for stock are l, proportionately so to our own. But we especially wish to direct attention to : practical character of the experiments ıich they offer prizes; and we can best by giving the words of the schedule— g out Indian corn, the mode of cultiva- f which is of little interest to our readers, ıgh William Cobbett laboured and *d* hard to get it introduced into this ry, and, from "his own experience," ished that it was a most profitable crop. :nglish farmers did not believe it was le to our climate then—we do'nt sup- that they think it would be now—so ıe regulations issued for its rearing by :w York Agricultural Society may safely itted from the prospectus. The rest, be seen, has interest for this country l as America; and as there does not to be any limitation of country as to tition for essays, some of our own ymen might try.

:XPERIMENTS, ESSAYS, AND REPORTS.

ıny essay on any agricultural subject, which approved and esteemed of sufficient value for ion in the *Transactions*, the Society will pay of 100 dols.

Book-Keeping.—To the farmer who presents and most approved farm accounts for the year l be awarded 10 dols.

Underdraining.—For the best example of underdraining, within three years, not less than 15 acres, with an account of the method pursued, the operations in detail, and an accurate statement of the cost; also of the improvement resulting, the mistakes made and difficulties encountered; the whole to form an essay worthy of publication, 50 dols.

Reclaiming Swamp Land.—For the best experiment in draining and reclaiming peat marshes and swamps, not less than 10 acres, 25 dols. To be accompanied by:—1st, Statement of the situation of the land previous to the commencement of the process; the kind and condition of the soil. 2d, The method pursued, with a particular account of the expense. 3d, The result and increased value of the land, if any.

Irrigation.—For the best experiment in the irrigation of land, 25 dols. To be accompanied by a full and detailed account of the condition of the land before irrigation; the quantity and quality of crops, and account of the manner of using the water, how applied, at what time and how long; the expense attending it; the increased crops, if any; and full details of the whole process, in preparing the fixtures and channels for the water, and if the same is used on hoed or grain crops as well as grass lands; a particular detail of the method employed to use the water, when needed, and to free the land from the same; and the character of the water, whether hard or soft; and if any difference has been observed in the use of hard and soft water, in the effect on the crop, to state the same.

Vineyards.—For the best vineyard, not less than one acre, 20 dols.; 2d do., 15 dols. To be accompanied by a full and detailed account of the soil, exposure and general character of the land; the method of culture; the varieties of the grape; the management during summer; the method of preserving the grapes in winter; the management of the vines in winter, and all the facts necessary to the full understanding of the management and preservation of the grape.

Gypsum.—For the most approved experiments in the use of gypsum, shewing the effects produced by its use on different kinds of soil and crops; the time and manner of its application and quantity applied; also the most approved manner of applying it to farm crops and grass; and in case of failure on any varieties of soil or crops, the cause of the failure, so far as can be ascertained, 50 dols.

Horses.—For the best approved essay on horses, with particular directions as to breeding, breaking, and rearing horses for the various purposes needed in this country, 50 dols.

Experiments with Wheat.—The Society offer premiums of, 1st, silver cup, value 30 dols.; and 2d, silver cup, value 20 dols., for approved reports, founded on actual experiment, on the comparative earliness, productiveness, and profits of the different varieties of wheat generally sown, and of any new and superior variety. At least four varieties to be sown, not less than one-fourth of an acre each. The ground to be as near alike as practicable, and to be cultivated in the same manner; produce to be given in measure and weight; time of ripening of each, and sample of each variety to be exhibited at the winter meeting of 1872.

Liquid Manure.—For an approved report of experiments in the saving, preparing, and applying liquid manures, the sum of 25 dols.—The applicants for this premium must give plans and specifications of the cisterns or vats for securing the manure, the cost of the same, and the materials used in their construction also drawings and descriptions of the implements used for the distribution and application of the manure, and the method and time of applying the same, and the result as applied to grass lands and grain crops. To be presented by the 1st of February 1872.

Compost Manures.— For an approved report of experiments in the preparation and application of compost manures, the sum of 25 dols. The applicant for the premium to give a full and detailed statement of the manures composted; the manner of preparing the same; the cost of preparation, and the manner and time of application; the results in its application upon grass lands and grain crops for two or more years, as compared with ordinary barn-yard manure. To be presented by the 1st of February 1872.

Manure.—For the best report upon saving, economizing, and applying the manure of the farm, 25 dols. A full and detailed account of the preparation and management of the manure. To be presented by the 1st of February 1872.

Tillage.—For the best Essay on ploughing and preparing ground for the various crops in ordinary cultivation, 25 dols.

Different descriptions of Food in the feeding of Dairy Stock.—For an approved report of experiments for the purpose of ascertaining the increased product of milk by the use of different kinds of food, 100 dols.—The attention of the experimenter is directed to the grasses best adapted to summer feeding; to crops best suited to soiling for food; of the value of hay for winter feeding, including both first and second cutting; of roots, Indian meal or other in winter; of straw, and the time at which hay should be cut so as to be the most profitable; also as to the effects of stabling the cows, and the difference between cooked and raw food; the experiment to be made with at least three cows of 4, 6, and 8 years old, and must be conducted through the year, giving an account of the quantity of food consumed, and the quantity of milk, and butter or cheese, and the loss or gain of the animals in weight during each month of experiment, and the quantity of manure made. (The above roots and other kinds of food are suggested; experimenters are neither restricted to them, nor obliged to experiment in all of them). Reference is made to Mr Horsfall's "Management of Dairy Cattle," Trans. 1856, pp. 223 to 424, and 709 to 767; and the Secretary, on application, will furnish the experimenters with a schedule of points to be embraced in the trial. Report to be sent in by the 1st of February 1872.

Woods and Planting.—Best transplanted forest trees, not less than 6 feet high, for permanent growth, not less than 1 acre, and not less than 600 trees per acre, 25 dols. For the best approved essay on the raising and cultivation of forest trees, including the management of woodland, 25 dols.

Management of Farms.—These premiums will be awarded only for farms whose condition and profitable management render them valuable examples. For the best cultivated farm of not less than fifty acres, mainly devoted to grain growing, exclusive of wood land and waste land, regard being had to the quantity and quality of produce, the manner and expense of cultivation, and the actual products; silver plate, value 100 dols. For the best cultivated farm of not less than fifty acres, mainly devoted to grazing and cheese or butter dairying, exclusive of wood and waste land, regard being had to the quantity and quality of produce, the manner and expense of cultivation, and especially to the management and feeding of stock and of conducting the dairy, and the actual products; silver plate, value 100 dols. For the best cultivated farm not less than thirty acres, exclusive of wood-land, regard being had to the quantity and quality of produce, &c., and actual products; silver plate, value 50 dols.

Full statements must be given in writing upon the points above mentioned, and in reply to such questions as may incidentally arise. A list of the leading points upon which information is required will be furnished by the Secretary on application.

Competitors for premiums on farms are desired to give notice to the Secretary on or before the 1st of August of their intention to compete; and some member or members of the Executive Committee will be assigned to visit and examine the farms and report on the same.

FIELD CROPS.

The land from which the crop for premium is claimed must be in one contiguous piece, and must be measured with chain and compass, and the surveyor must make affidavit to his survey. The applicant and one other person who assisted in harvesting and measuring the crop, must make affidavit of the quantity of grain raised, and that the crop grown was in the usual course of cultivation, and must also state the whole quantity of land in the piece of which that intended for premium is a part. The *entire crop* upon the piece entered for premium to be harvested and measured. Forms of affidavit for surveyor and applicant are annexed. The premiums on field crops are intended only for crops raised upon the farm in its usual cultivation.

Statement of Farm Crops.—1. Statement of the previous crop, if any, and how manured. 2. The kind and condition of the soil, and the location of the farm. 3. The quantity of manure on the crop the manner of its application; the quantity and kind of seed. 4. The time and manner of sowing, harvesting, and cleaning the crop, and the actual yield by weight and measure, the statute bushel in grain crops to be used; the market value of the crop, and the place where marketed. 5. A detailed account of the expenses of cultivation. 6. A sample of the grain must be presented at the annual meeting. 7. In the case of broom corn, the amount of weight of brush per acre, when prepared for market, and the method of preparing. 8. In case of flax, the amount of lint and seed, and the method of preparing the flax for market.

The following forms of affidavit explain themselves :—

——— County, ss. A. B., being duly sworn, says he is a surveyor, that he surveyed with chain and compass the land upon which C. D. raised a crop of ——— the past season, and that the land was in one contiguous piece, and that the quantity is ——— acres, and no more. A. B., Surveyor.

Subscribed and sworn before me this }
——— day of ———, 18—. }
——— ———, Justice.

——— County, ss. C. D., being duly sworn, says that he raised a crop of ——— the past season upon the land surveyed by A. B., and that the quantity of grain raised thereon was ——— bushels, measured in a sealed half measure, weighing ——— lb. per measured bushel; and that he was assisted in harvesting and measuring said crop by E. F.; and that the statement annexed, subscribed by this deponent, as to the manner of cultivation, expenses, &c., is in all respects true, to the best of his knowledge and belief; and that the sample of grain exhibited is a fair average sample of the whole crop. C. D.

Subscribed and sworn before me this }
——— day of ——— 18—. }
——— ———, Justice.

——— County, ss. E. F., being duly sworn, says that he assisted C. D. in harvesting, getting out and measuring his crop of ———, referred to in the above affidavit; and that the quantity of grain was ——— bushels, as stated in the affidavit of C. D. E. F.

Subscribed and sworn before me this }
——— day of ——— 18—. }
——— ———, Justice.

The Farm.

THE WHEAT CROP.

nber for July, page 11, under e heading, we directed atten- at and wide-spread destruction at during the preceding few small grub or caterpillar which, the centre of healthy plants, re the leaves begin to open and s its way downward, devouring r leaves, the tops of which then ed, followed by the others, as esses to full size, at which stage y reached near or close to the the plant, and then changes is form; after converting what eared to be highly-promising nto patchy or bare lands, so up and sowing with barley or many deemed the only modes n the total loss of a year's secured a number of these as before mentioned, became to their chrysalis stage of ex- 20th of May, we kept them arth in the bottom of a glass nouth of which was covered , having many pin holes pricked dmission of air. On the 22d lying about five weeks, the escaped from their chrysalis appeared actively engaged in away, which they did on the ghtly raised, and immediately dow, where they were caught glass tubes for examination. as kept in a well-aired room t, and the flies have come out ll the present time, nor do the to be all hatched. In appear- rather smaller, more slender, er coloured, and more hairy, or rather bristly, than the common house fly (Musca domestica), for which they might, however, be readily mistaken by a casual observer; but on looking at them through a pocket microscope the difference is seen to be very marked. Like the house fly, it belongs to the order Diptera of Linnæus, or two-winged flies, the wings being membranous, veined, and transparent, but they are rather more iridescent than those of that domestic pest. Head, and more especially the eyes, of a purplish brown colour, the antennæ delicately feathery, and rather shorter than the head; the neck, and between the eyes, thickly furnished with short dark bristly hairs. The thorax, or centre portion, of a light yellowish fawn colour, and having six lines of strong blackish bristles on the upper surface. Abdomen similarly coloured with the thorax, but more thickly covered with blackish bristly hairs, longer than both the thorax and head, and composed of seven or eight segments, of which four are larger and more decidedly marked than the others. Legs of a dusky colour, but whitish at the extremities, and thickly covered with dark bristles. Some of the flies (females?) shew only four segments distinctly in the abdomen, and in these the bristly hairs are fewer, as well as smaller, than in the others.

Though the preceding description may not be deemed entomologically correct, it will serve to aid observers in detecting this tiny, yet formidable wheat destroyer, and in enabling them to trace the different stages of its existence which yet intervene between its present fly-state and that of the destroying caterpillar of spring, without a perfect knowledge of which, searching for remedial means to prevent or counteract its ravages, will only be like groping in the dark. As these flies are now abundant in the wheat fields where their larvæ recently wrought so much mischief, it is highly desirable that all having opportunities should watch their present as well as future actions and development. They are now, or will shortly be engaged in egg-laying. Let the when, how, and where of this performance be carefully noted. The hatching will be another stage for discovery; and it is probable that another generation may yet intervene between the present fly existence, and the young plant-devouring grub. Should this surmise be correct, it is of the utmost consequence to ascertain on what these grubs in-feed, when their flies are hatched, how and when their eggs are deposited, and to note the earliest appearance of the young in the wheat plants.

Formerly we pointed out the urgent necessity of offering suitable awards for tracing the history of plant-destroying insects, as well as for the discovery of remedial modes of arresting or counteracting their ravages. At present most of our information in these matters are derived from Continental or North American sources—where the prosecution of such researches is liberally a encoured—but, gralthough the results so obtained a highly interesting and important, they do not meet all, or nearly all, our home wants, as every country has insects peculiar to itself. It is, therefore, to be hoped that both our national and local agricultural societies will quickly bestir themselves in this direction by offering liberal prizes, such as will repay careful investigators for the intricate and laborious experiments and researches which they must undertake in order to obtain the much-needed knowledge of our insignificant yet formidable plant-destroying insects.

SHALLOW OR DEEP SOWING OF GRASS SEEDS.

WE are indebted to an esteemed correspondent in Mid-Lothian for the following article on the above subject:—

It seems to be a prevailing opinion among farmers that the nearer the surface clover and grass seeds can be sown, the better chance they have of growing. Experience obliges me to form a different opinion.

The experiments of Mr Stirling, of Glenbervie, are often brought forward as proving the evil of deep sowing. Now, in his experiments, the seeds were sown on finely-sifted black mould, which was kept moist during the process of germination; so that the seeds seems to grow best when sown on the surface, or when covered a quarter-of-an-inch deep. Seeds, to vegetate, need moisture, air, and warmth; darkness also being advantageous. In this case, the soil being very fine and kept constantly moist, the seeds 2 or 3 inches deep would be prevented from germinating by the want of air. In the field, circumstances are very different. With being worked in drought the soil is often quite dry for 1½ inch deep, and the soil is cloddy too (although the clods may be small), and is consequently open to the drought. When seed is sown broadcast, and attempted to be covered ¼ inch deep or so, a large proportion is left on the surface; which, along with that which is covered, may sprout with the first shower; but, dry weather coming on again, all that is on the surface, and that which is only slightly covered being under the drying influences of the sun and wind, is immediately killed. If the seed were sown 1½ inch deep—the depth at which broadcast corn is usually put—it would still have all the requisites of germination; moisture, and that constantly; air in plenty, the worked soil above being open; darkness also, and warmth enough too, from the heat of the sun going through the dry soil above. My own experience on heavy soil is, that it is a very precarious matter to sow clover and grass seeds shallow.

A neighbour tried the experiment of sowing a ridge of his hay seeds along with the corn on the plough furrow, and the clover was much better on this ridge than the rest of the field, which was sown after the corn was harrowed, and covered with light seed-harrows.

This year I sowed rye-grass and clover in the garden at various depths, without raking the soil very fine, but leaving it as the harrows would the field, with the following results :—

RYE-GRASS—100 SEEDS IN EACH LOT, SOWN APRIL 5.

	Depth, Inch.	Growth counted May 4.	Weight of Herbage, July 15.
1	0	6	⅝ oz.
2	1	50	⅜ ,,
3	2	69	5 ,,
4	3	47	3½ ,,
5	4	1	
6	5	0	

RED CLOVER, SOWN MAY 9.

	Depth. Inch.	Growth counted June 9.	
7	0	35	
8	½	40	Blank in the middle of the row, as if the plants had been killed by some accident.
9	1	25	
10	1½	38	
11	2	5	
12	3	2	
13	4	0	
14	3	27	

In lots 1 and 7 the seeds were sown on the surface, and merely covered out of sight with dust. In lot 14 the soil was made very fine. In the rye-grass lots the plants of those sown 2 and 3 inches deep were always very strong, those 1 inch were from the first very weakly. Lots 7 to 12, plants equally strong.

So my conclusion is, that our clover and grass seed mixtures should be well harrowed in with heavy harrows, 1 inch deep at least, and that it would be no disadvantage to sow even on the plough-furrow.

HOW TO KILL OFF WEEDS.

"ILL weeds wax weel," is an old Scottish proverb. In England a similar one exists, to the effect that, "weeds grow apace." Our northern neighbours might have left out the *ill* in the proverb, as we take it that no weeds are good. Within recent times, on heavy lands, fallowing was the method adopted for killing them; but this, of course, was an unprofitable method, as it involved the loss of the produce of a field, or fields, for a year. Green crops, instead of fallow, have often been substituted, and if they once get fairly away, the weeds have no chance. The broad blades of the turnips, or the luxuriant stems of the potato, keep in check the noxious inhabitants of the soil.

It is strange that, under all climatical conditions, those worthless products should grow when the tenderly cared for seeds, which supplieth the food of man and beast, will at times scarcely shew a blade above ground. The fly injures weeds not; beetles, which this year have eaten the seedling turnips, pass over them without even tasting; as abstemious, apparently, of these vegetable pests as if they were prussic acid. This fact has been particularly noticeable in many parts this year. In the spring, wheat was devoured by a curious and insidious insect or fly, described at page 154. Many fields had to be ploughed down altogether, and resown several times. And even after all the farmer's toil and trouble, there were patches in many fields which looked quite bare. With the moisture and the sun, the dormant blades in these places sprung up slowly and languidly. But they did come. Yet swifter and surer, and stronger, came what may be named the tares, which some enemy had sown long ages ago. The wheat blades grew; but quicker the poppies, the mustard seed, and the gowans, and the red, yellow and white eclipse the green. Once the weeds get the start, their leaves and gaudy flowers choke out the life of the unpretending bread commodity.

There is, however, a very simple plan of killing weeds — at least it has proved successful in grass lands on several occasions. Nothing further is required than to mow the weeds down twice a week, for two or three weeks, when it will be found that the grass will overtop the valueless stuff, and shoot forth a vigorous and healthy blade.

In reference to this subject, a correspondent informs us that on one occasion his grass fields had in them, to all appearance, more weeds than forage. As he is a careful farmer and a cleanly one, he naturally concluded that the grass seed had been adulterated, and complained to the seller about it; and the disposer asseverated that the stuff he sold was of excellent quality. The weeds were there, however, choking up the grass, and the farmer resolved upon cutting them. The result was, that after topping the weeds about half-a-dozen times, the grass got fairly the better of them and turned out a magnificent crop. On uumerous occasions a like method has been pursued, and the success has been equally real. This practice should be more generally adopted.

LONK SHEEP.

AT the Great International Exhibition at Battersea, in 1862, where stock from all parts of Europe were congregated, there was one breed of sheep which particularly attracted the attention of Scotchmen. It will be remembered that the Highland and Agricultural Society that year sacrificed their own Show (which should have been held at Kelso), and threw their prize money into the common fund in the Metropolis, in order that there might be one great centre, where every one could see "the best of everything," no matter what were his tastes.

Whether that stock exhibition was as great a success as it might have been with the money premiums offered, may be doubted. For one thing, it was too far out of the heart of London; the expenses of transit of stock were too heavy from the far north of Scotland and the Continent, and the interest of the implement makers was divided between Battersea and *The* Great Exhibition of all artistic and manufactured commodities, and raw materials. Still there was very much to be learned at it; and much profit, besides pleasant recollections, have been derived from the visit to it by many farmers whom we know.

For Scotchmen, as we have said, the Lonk sheep possessed great attraction. In THE FARMER report at the time, it was remarked that of all the breeds of sheep shewn "those of most interest to northern Scotchmen were the mountain breed called Lonks, exhibited by Mr Peel, of Knowlemere, a blackfaced sheep with a frame approaching in size that of the gigantic Cotswold, and carrying a heavy and valuable fleece of fine wool, not like our hairy blackfaced. They are of hardy constitution, well adapted for the Scottish hills."

It is eight years since this was written, and at that time, so far as we are aware, they had not been tried in Scotland; in fact, so far as we know, they had not even been seen. From a letter in our correspondence column, however, it will be noticed that they have had a trial on the farms of Moodlaw and Stidrigs, and that indefatigable agricultural lady, Miss Hope Johnstone, vouches as to their profitable adaptability to Scottish soil.

From Mr Peel, who is truthfully described by Miss Johnstone as "the *perfecter* of the Lonk breed" (an old indigenous breed inhabiting the Lancashire and Yorkshire hills, the purest blood being in the neighbourhood of Keighley, Rochdale, and Clitheroe), that lady received some stock of this description; and, according to her account, judging from her experience last winter and spring, it was her impression "that they resisted cold and disease better than either the Scotch blackfaces or Cheviots. We did not lose a single one of the Lonks, and only two out of the twenty-three lambs produced by the twenty ewes, and these two died from inflammation, from 'grass sickness,' or over condition. I intend to shew twelve Scotch blackfaced gimmers with cross Lonk lambs, which are an excellent specimen of the value of such a cross." The fleece of one of the most celebrated sires of these sheep weighed no less than 18 lb., but the average clip overhead is stated by Mr Peel to be 5 or 6 lb. The quality being good, it realizes excellent prices in the market.

Having given up farming on the extensive scale in which she has hitherto carried it on, Miss Hope Johnstone cannot carry through the experiments with Lonks in the satisfactory manner she would like; therefore she proposes to exhibit and dispose of, at the Dumfries Show of the Highland and Agricultural Society, twenty ewes, twenty-one lambs, and three rams. These, she says, may go back to Moodlaw and Stidrigs should they be wanted by her successors in these farms; or, failing them, others who wish to try them fairly may have them, which appears to mean, in fact, that they will be sold to the highest bidder. If they go to Moodlaw, and are really better adapted for the place than Cheviots, they must, with good treatment, come out grand, as we all know that nothing could come up to the Cheviots reared there by Mr Bryden, Miss Johnstone's predecessor; and we trust, for the benefit of her successor, if he buys her Lonks, that he may be as fortunate with them as Mr Bryden with the Cheviots.

IMPORTS AND EXPORTS OF AGRICULTURAL COMMODITIES

THE Board of Trade Returns for the first half of this year have recently been issued. These statistics shew that there was a great decrease in the supplies of cattle and sheep in the six months, as compared with the corresponding period in 1869. The total quantity of oxen received was 58,972 in the half-year 1870, as against 99,486 last, or a diminution of about 40 per cent. Of sheep we had, up to the end of June this year, 327,678, as against 412,316 in the corresponding period of 1869. Lambs were in less demand, 9822, to compare with 11,567 in the like term of the previous year. Swine and hogs were received in larger numbers, 41,089, in comparison with 23,637.

The imports of all kinds of grain used for food were much in excess of the half-year's receipts in 1869. Of wheat alone we had 13,843,124 cwts., as against 12,194,021. The following table shews that our chief supplies were derived from the United States Russia, and Prussia:—

	June 1869. Cwts.	June 1870. Cwts.
WHEAT.		
Russia	3,316,375	4,563,334
Denmark	201,479	221,187
Prussia	2,104,509	1,215,653
Schleswig Holstein, Lauenburg	27,609	10,511
Mecklenburg	323,492	313,567
Hanse Towns	301,679	152,196
France	155,200	17,377
Illyria, Croatia, Dalmatia	496,494	42,327
Turkey, Wallachia, Moldavia	768,763	220,032
Egypt	353,107	95,550
United States	3,657,308	6,081,277
Chili	193,385	187,020
British N. America	105,227	580,655
Other Countries	189,394	142,438
Total	12,194,021	13,843,124
BARLEY	4,686,894	3,824,222
OATS	2,368,099	4,467,633
PEAS	372,233	879,425
BEANS	961,066	768,002
INDIAN CORN, MAIZE	6,618,574	6,498,538
WHEATMEAL & Flour	1,817,580	2,476,192

The imports of butter were less in quantity than during the first half of the year 1869, but there was an augmentation in the receipts of cheese. The number of eggs sent from abroad was fewer by about 2,000,000 than in the corresponding term of 1869; the precise numbers were for last half year 252,504,120, and for this halfyear ending June, 249,017,280. There was comparatively little alteration in the imports of fresh or slightly salted meat, and a decrease in bacon and hams and salted beef. In pork there was a slight increase, and also in meat not specially described before. The exact quantities of bacon and hams, beef, and of pork, were for the half year for which the returns are made up, bacon and hams, 361,259 cwts.; beef, 98,648; pork, 102,187 cwts. There was a great decrease in the supplies of potatoes from foreign countries, our own yield last year having turned out well. The quantities received were in the first half of 1870, 435,998 cwts., in comparison with 826,327 in the first six months of the preceding year.

The imports of guano during the six months ended June 30th, were nearly treble the quantity received up to the same date of the year 1869, 118,598 tons, as against 43,499 during the first half of the year 1869. Bones were also imported in slightly increased quantities, 35,953 tons to compare with 33,950.

With regard to feeding stuffs there was a decrease in the import of oil-seeds to the extent of about 11,000 tons, the quantities being respectively this year, so far as the returns are made up and published, 63,735 and 74,948 tons. In cotton seed there has been an increase of nearly 8000 tons, 79,179 tons, being received against 71,187 tons. The imports of rape more than doubled in the six months, the quantity reaching us this year being 124,122 qrs. In flaxseed and linseed there was a considerable diminution in the receipts—to the extent of upwards of 80,000 qrs.

In clover seed also the decline was very marked, the supplies only reaching 117,578 cwts. to compare with 156,327 cwts. in the first half of 1869. There was a large increase in the supply of tallow, the total quantity received being 574,928 cwts.

The total quantity of flax, &c., received in the half-year was 905,097 cwts., more than half of which came from Russia; the two other countries standing next to Russia, as exporters, being Holland and Belgium. The excess in imports over those of the first half of the previous year is about 19,000 cwts. There is a decrease in the receipts of hemp to the extent of nearly 10,000 cwts.

We received 26,000,000 lb. more of wool up to the end of June this year, than we did in the like period of 1869, the excess coming nearly all from Australia. The following table shews the exact figures and the sources whence our supplies are derived:—

	lbs.	lbs.
From Europe............	7,984,679	6,547,523
British possessions in South Africa....................	14,931,178	15,367,167
British India...............	6,495,905	4,021,284
Australia....................	105,772,827	136,465,703
Other countries...........	8,990,144	7,901,572
Total.............	144,174,733	170,303,246

There was a small supply of imported bacon and hams exported from this country again; 359,708 cwts. of wheat, 29,851 of wheatmeal and flour, 2230 tons of guano, and 50,943,703 lb. of wool, or almost one-third of the whole of the quantity we received.

The value of the exports of British and Irish agricultural produce was as follows:—Bacon and hams, £51,731; beef and pork, £10,852; beer and ale, £1,110,603; butter, £137,664; cheese, £50,895, all of which sums are slightly in advance of those received for the same products in the corresponding period of 1869. The export of horses has fallen off nearly one-half in number, and proportionately so in value, the numbers sent away having been, up to the end of June, 829, and the value £45,620. It is certain that the returns of July and August, however, will shew a large increase in horses. There was a decrease in the value of wool exported, of nearly £60,000, the sums realized in last half-year being £249,875, in the corresponding period of 1869, £307,968.

ROYAL AGRICULTURAL SOCIETY'S FIRST PRIZE FARM.

FEW competitions have created more interest than that which has occupied attention during the last week, between the various candidates for Mr Mason's prizes. We hardly need remind our readers that a cup, valued at £100, was offered by Mr Mason, late High Sheriff of the county of Oxford, for the best managed farm held by a tenant in a certain large, but circumscribed, district. The fact has for the last few months been well known in agricultural circles, and considerable interest has been expressed as to the result. Mr Torr, Mr Keary, and Mr Gibbons formed a very well qualified committee of inspection, and these gentlemen, after visiting the candidate farms, first in April, and again within the last fortnight, have arrived at a decision already before the public. It is well known now, says the *Agricultural Gazette*, that what was a matter of report a few weeks ago is true, namely, that the judges, after mature consideration, have decided to award the first prize to a lady. We regard this as a significant fact. Much has lately been said and written upon the capabilities of the fairer and gentler sex to engage in more masculine duties than have hitherto engaged their attention. The subject is a difficult one, and it is far from our intention now to discuss it. One thing is however clear, namely, that three experienced and accredited agriculturists have, after the closest scrutiny and the greatest care, concluded that, in an area of some hundreds of square miles, the best managed farm is in the hands of a woman. When the decision was known on Tuesday, we were naturally anxious to visit so notable a farm, and accordingly, on Wednesday morning we left Oxford, its crowded show-yard, and throng of visitors, and sought the privilege of a quiet walk round this distinguished piece of the nineteenth century cultivation. Claiming to be country bred, and not altogether unacquainted with rural operations, we did not expect to meet with that starting complication of modern improvements so well described in "Talpa Loquitur," by Mr Wren Hoskyns. Any one who will look into the inimitable illustrations which enliven that refreshing work, will find a picture of what the cockney expected on a real go-a-head farm. He was disappointed. His imagination pictured the steam cultivator at work breaking up the soil, the drill sowing the seed, the liquid manure hose distributing fertility broadcast, the reaping machine cutting down a perfect jungle of crops, the steam threshing-machine preparing the same for market, the mill grinding corn, cattle feeding on cooked viands of the most approved scientific composition, and all going on at once, giving a picture of high farming consistent with express travelling and Transatlantic telegraphy. He was disappointed. What actually met his gaze was the unobtrusive quiet of a well-managed farm, not the rattle of a factory, the natural development of a vegetable and animal growth assisted, but not substituted, by modern applications.

We were courteously received at Ashgrove Farm, and although our time was short, we saw something of the management, which will now be unmercifully criticised. The prize farm is situated upon the Duke of Marlborough's estates. It is 14 miles from Oxford, and lies about 5 or 6 miles to the south-east of Bicester. The soil rests upon the stone brash of the oolite, and is of uniformly poor quality, free working, and pleasant to farm, capable of growing sheep well, and producing a nice malting sample of barley. The soil is thin, and rests on a rubbly, rocky subsoil, which precludes the possibility of deep cultivation. The poorness of the soil is doubtless one of the points which attracted the attention of the judges, and it should be steadily kept in view in inspecting the farm. Almost the whole of the occupation is arable. It embraces 880 acres, more or less, 70 of which are very poor pasture. The farm was taken on lease by the late Mr Millington, in 1854, for 21 years, and was under his management until his lamented death, about a year ago. Mrs Millington now holds the farm, and much of her success in the recent competition is due to the able management of her brother, Mr Ormond, who has carried out the ideas and system of management pursued by the late Mr Millington. In a report so brief as the present per force must be, we cannot do better than attempt to give some idea of the general impression conveyed to a visitor. First, then, he will be struck by the buildings. He will see yards without sheds, generally poor accommodation for cattle; he will not will not see cattle boxes or elaborate barn arrangements. The stables are devoid of stalls, the design of the buildings is altogether inconsistent with those rules which should guide the architect in planning them. He may perhaps be staggered by the sight of wooden ploughs, antiquated drags, clumsy waggons, and old-fashioned utensils of various kinds; a very different assortment of implements will meet his eye from what perhaps he has recently witnessed at the Oxford meeting; and, in a word, he may be a little discouraged with what he sees. Again, when he glances at the live-stock, he will see a mixed and moderate class of cattle, a shabby lot of pigs, no grand sheep, and a poor lot of poultry. If he looks at the fences, he will find nothing to admire particularly, and as he walks over the grass land he will be offended by the presence of rushes, unstubbed thorns, ragged ditches, and not very neatly-filled drains.

Again, as he extends his observations from the buildings over the farm itself, he will fail to see the prescribed sheepfold, with its hurdles and its fresh vetches or cabbages, its troughs for artificial food, its water-carts, and its shelter from the noonday heat. Lambs will be seen, still unweaned, on large bare pieces of seeds, with their mothers, looking anything but blooming, under the blaze of this tropical July sun.

Such were some of the features of the best-managed farm in Oxfordshire which struck us, and after observing them we were tempted to ask why, under such circumstances, the judges awarded a prize that we might have expected to see associated with something more in harmony with modern ideas? We do not desire to carp at the decision of three experienced and reliable men, and we have not compared the Ashgrove Farm with its competitors. We had rather proceed to point out those features that are worthy of attention. We have before noticed that the land is poor, and we now add that it bears a magnificent crop of wheat and barley. The portion under corn is indeed a pleasant sight, both from its joyful luxuriance, and, so far as we could judge, its cleanness. Then, again, when the roots are looked at, they are surprisingly good for the season and for the district. There is nothing like them for miles around. It is, then, in these main features of corn and roots that the great charm of this occupation lies, and far be it from us to underrate their importance. There are eighteen horses kept, and the work is partially performed by steam cultivation in the spring. The horses are now receiving one bushel per week of Indian corn, crushed, and straw chaff. The steam cultivation is hired, and the grubber, or cultivator, is preferred to the plough. The rotation followed is that pursued in Lincolnshire, and the general management partakes of that of the same county.

The rotation is as follows:—1st, roots, principally Swedes and turnips; 2d, barley; 3d, seeds; 4th, two-thirds wheat and one-third barley, including a portion of vetches. Catch crops are seldom sown, and the vetches occupy any portion of the seed land not thought to be in good enough condition to bear a corn crop. Vetches, therefore, on the farm follow seeds, and are again followed by roots, and this will bring any land out of condition into a good state. The rotation is also slightly deviated from, by ploughing up some of the seed land early for mustard, afterwards to be followed, like the remaining seed land, with wheat; and the result is said to be 2 qrs. more wheat than after seeds at once ploughed for the wheat crop. Glancing at each crop in rotation, we find that the cultivation for roots embraces one deep (as possible) three-horse furrow in the autumn, followed by steam cultivation in the spring. Up to last year, when Fowler's tackle was employed, Smith's cultivator had been in use. The land is afterwards worked with Coleman's cultivator, and the roots are sown with 4 cwt. of Hale's superphosphate put in with water on the flat. Two-thirds of the turnip crop are eaten on the land with cake and corn, and one-third is drawn off for the cattle. No farm-yard manure is ever applied to the root crop, but all is devoted to the seed land, and is now being spread over the land as a preparation for wheat, according to Lincolnshire usage. No top-dressings are used, and, to quote from Mr Ormond, the opinion at Ashgrove is, that top-dressing is like "putting on a false coat." All is put under the soil. Still, oilcake in the form of sheep-dung is top-dressed on the land, and the condition of the farm must be well-supported by the £1000 to £1200 worth of cake annually spent on the farm. There is also an expenditure of about £300 per annum in the form of superphosphate, no other purchased manure being imported.

There is a flock of 400 Lincoln ewes maintained, and all tegs are either fatted or find their way into the flock. Ewes, culls, theaves, and lambs constitute a standing flock of 950 sheep, and the clip is estimated at from two to three fleeces per tod. The lambs remain till late with their mothers, as above stated, and the first summer the management appears to be anything but forcing.

Twenty-five calves are usually weaned every spring upon linseed gruel, and with the assistance of two cows. These cattle are kept until they are three years old, and are then disposed of at from £16 to £18 each. The stores receive from 2 to 5 lb. of linseed cake per day, according to their age, with a restricted amount of roots.

Labourers are well cared for in the matter of wages. We were informed that the average wage of the men amounts to close upon 18s. per week, while that of the neighbourhood is very much less. The increased wage is principally the result of a judicious use of task-work. We could not learn that any special method was used in the arrangement of labour upon the farm, excepting that the people do not work in gangs, and as much of the work is let by piece as possible. The labour bill is £1200 per annum, or close upon 30s. per acre over the arable land. This is an amount which agrees well with former carefully made estimates as to what labour ought to cost. Lastly, we may say that the impression conveyed by a visit to Mrs Millington's farm is, that the scene of a paying business has been inspected. There is little trace of what is known as the model or amateur farm, and we should certainly like to have seen the live-stock and buildings more in accordance with the year we live in.

We believe, however, that we anticipate the probable answer of the judges to such a criticism when we say that, after all, the application of tenant's capital was to be considered, and not the expenditure of landlord's money in expensive buildings.

We sum up our remarks by adding, that the land on the prize-farm is well done, but the live stock is unmistakably below par.

THE ROYAL AGRICULTURAL SOCIETY'S SECOND PRIZE FARM.

FROM our contemporary, the *Agricultural Gazette*, we extract the following account of the Second Prize Farm of the Royal Agricultural Society:—

In presenting to our readers a short report of the farm to which the second place in the competition created by Mr Mason has been awarded, it will probably be expected that a strict comparison between it and the first prize farm, upon which we have already reported, should be made. It is here, however, that we feel the difficulty of our task, and also what must have been that experienced by the judges in deciding between the competing farms. We shall endeavour to point out some of these difficulties. We have to compare a large farm of 880 acres with one of 420 acres—the first confessedly a poor land farm which [illegible] as hi[illegible] [illegible]rted at 24[illegible] [illegible] second is [illegible] [illegible] are mil[illegible] [illegible]wenty-on[illegible] years' [illegible] year. Again one farm exhibit[illegible] good managemen[illegible] in certain dep[illegible]nts which, perhaps, i[illegible] [illegible] same time, when that rival is further examined, good points are discovered wanting in the other. It is a clear principle, which ought to be kept in view, that the late competition was between tenants, and not between landlords. Not that we would go the length of an eminent authority it was our fortune to meet with quite recently, and consider that the tenant who erected any building or made any improvement usually looked upon as landlord's work, should, so far from being commended, be to a certain extent disqualified in the competition. Such a verdict is too harsh, and most certainly impracticable. Why has a tenant possessed of valuable sheep or cattle, each animal probably valued at a sum far beyond the expense of erecting shed room—why, we ask, should such a man be looked upon as foolish for erecting shelter, in the form of sheds, in the field or at the homestead? Certainly it ought to have been done by the landlord, but in case the landlord refuses, why should not the tenant make a calculation as to whether it will pay him better to spend a certain sum in such necessary shelter rather than in some application to the soil or some extra food? While, then, we agree with the general principle that tenants' capital ought to be devoted to what is understood as tenants' improvements, and the stocking of the farm, we think that circumstances may arise in which the expenditure of tenants' capital upon what should have been done by the landlord may not be altogether unwise or worthy of deprecation.

Last week we summed up our remarks upon Mrs Millington's farm by stating, that in general the crop was excellent, and the root crop especially worthy of commendation, while the live stock could not be spoken of as good, nor the provision for summer sheep-keep as effective. There was also a general want of style, best understood by contrasting this farm with the best managed occupations of Norfolk, Lincolnshire, or the Lothians. We have now had the pleasure of inspecting Mr John Treadwell's farm, and, without further preface, proceed to chronicle our impressions upon it.

Mr Treadwell's holding is situated seven miles west of Aylesbury, and the same distance north-east of Thame. It lies upon the Winchendon Hills, on the west slope of the celebrated Vale of Aylesbury, into which a portion of it stretches. The form of the farm is singular, and may be described as a table-land, with a downward slope on every side of it. It was spoken of some years ago by Mr Love (for this is not the first time that the "model farm" has been before the public) as a basin turned upside down in a basin of larger diamenter; or, in other words, a rounded hill in a valley which surrounds it on all sides. This peculiarity of form is accompanied with the disadvantage of a large proportion of bare, easily burnt hill ends, peculiarly exposed to the evil effects of a long-continued drought. The farm is 420 acres in extent, 240 acres of which are permanent pasture. The land may in general be spoken of as good deep stone brash, but very various, as is best seen by the sudden changes in vegetation as the observer walks over certain fields. Although a portion of the farm has for many years been occupied by members of the Treadwell family the present tenant has only had possession for five years, and he holds under the Duke of Marlborough from year to year. The lease contains an indefinite and unsatisfactory clause, which may be looked upon as a kind of imperfect tenant-right.

As in the case of Mrs Millington's farm, it is our wish to present a general impression of Mr Treadwell's management, and afterwards to furnish a few particulars as to details. Farming may be well divided into attention to crops, to stock, and to a smaller class of important, but more minute objects of care. Unquestionably on passing over Mr Treadwell's farm the fence will be pronounced weak. Let it be remembered, however, that all gaps are neatly railed it is as living fences, and not as divisions an protections, that they are deficient. The thorn are evidently old, and we would ask how far tenant without any lease can be held responsibl for this? Since it would be the height of foll for Mr Treadwell to throw down his old fence and plant new ones at his own expense, an since such would be the only way of rectifyin this the most disfiguring feature on his farm, appears to us that the condition of the fence should not be marked against it in contrastin it with one held under lease for twenty-on years, in which the fences are in somewhat bett order. The first crop we noticed was a ver fine piece of mangold wurtzel, fully equal to wha we witnessed at Ashgrove Farm. The Swede are so far a failure. A nice plant of youn turnips, drilled between rows of beans and pea which were being removed on the day of ou visit, attests the thrifty character of the manag ment pursued. The corn crop is everythin that could be wished. One magnificent an impenetrable crop of Rivet wheat struck u as remarkably excellent, while the finer wheat and barley were promising in the extreme.

This district has not been in the slighte degree favoured during the present unpropitio season. We walked over one small piece land, for instance, that had been sown with oat These oats never came up, and finally it wa thought best to plough and sow with rap Now, in the latter end of July, the oats have ju made their appearance with the rape, and gi promise of yielding a piece of nice autumn kee So much for the crops. Turning to the liv stock, we found, as above stated, a good stoc of fifty dairy cows, which produce butter for th London market. The herd has long bee crossed with first-rate shorthorn bulls, and ha assumed a stylish and uniform appearanc Reference to Mr Treadwell's private herd-boo reveals the names of Chancellor (25731), Whar dale Wild Eyes (27788), Marmion (22288 Advocate (21152), and other good bulls, man of which are of Penrhyn origin. Marmion, serviceable and well-bred young bull, is no being used in the herd. Twenty calves a weaned annually on skimmed milk, and a early introduced to an allowance of cake. Th greater number of cows calve late in autumn an winter. During their first summer the calv receive 1½ lb. of cake with grass; the secon winter, chaff and a few pulped roots, or no roo and cake; the second summer, grass alone; the third winter, straw and 3 lb. of cake, and about this time, if heifers, they drop their first calves. The steers are fed off in sheds.

Nine working horses are kept; in winter they receive cut food wholly, viz., straw, with very little hay cut up, and 2 bushels of oats each per week; in summer they lie out at grass, and have about half a bushel of oats each per week when working hard; no corn when not very busy. The labour costs about £700 a-year. The cattlemen receive 12s. or 13s. per week, and beer or milk for breakfast in winter, 3s. or 4s. more in hay time and harvest; the other men, 10s. and 11s. in winter, more in summer, but all is let by the piece that will allow of it, and they earn as much as 15s. or 16s. in spring, of course much more in hay and harvest time.

We need hardly say a word on the subject of Mr Treadwell's sheep. He has been for so long a successful exhibitor of Oxford Downs, that his flock is known to every visitor of our great shows. Unfortunately, 200 of his 220 ewes were from home. Here we saw what we missed at Ashgrove, namely, the vetches, the cabbages, and the sheepfold, the shelter from the sun, and the usual appliances for carrying sheep on well through the summer. The lambs were weaned in June; 220 ewes yield 270 lambs now alive, and we were told by Mr Treadwell that he had been bid £5 a-head for 200 ewes. As an interesting fact in connexion with Oxford Down sheep, we may mention that in one quite recent year 448 fleeces gave 123 tods 18 lb. of wool; and, we believe, this year 474 fleeces gave 134 tods 21 lb. of wool.

A remarkably good stock of well-bred Berkshire pigs is kept to consume the skim milk, the residue from the butter manufactory. Boars have been purchased from Mr King Tombs and other breeders, and as level, thick, well headed pigs it will be difficult to find a better stock. A few horses are bred for keeping up the working team of the farm. Poultry does not appear to evoke the same enthusiastic interest shewn in the management of the other sections of live-stock.

With regard to the rotation of crops, a six course is followed: [illegible] 2d, barley or oats; 3d, half seed and half broad clover, about 4 acres being reserved for cabbages; 4th, barley or oats on the seeds, and wheat on the clover and cabbage land; 5th, winter and spring beans and peas drilled, 16 inches apart, with turnips drilled between; 6th, wheat after the early, and barley after the late fed turnips. Vetches occupy about one-half of the sixth or last year's stubbles, and this portion comes in for swedes and turnips. The remaining half is kept free, and worked for mangold. This management is alternated in consecutive rotation, so that mangold only comes once in twelve years on the same land. Five acres of mangold is also usually taken out of the fifth or pulse section of the rotation. and these are drawn for cattle. The cultivation for roots consists in forking stubbles, after which a very thick coating of dung is applied. This is ploughed in with Robinson's subsoiler, an implement furnished with two following coulters, that completely break the bottom of the furrow. This plough is drawn by six horses, and penetrates 10 inches in depth. The land is thus left for the winter, and in the spring the cultivator or scuffler, and sometimes, as in the present season, the drag only is used to obtain a tilth. The mangold is drilled 16 inches, and the swedes 22 inches apart, and are put in with the Bedford drill without water, ashes, or artificial manure of any kind whatever; 10 lb. of mangold and 3 lb. of swedes and turnips are sown per acre, and only 1 lb. of seed when turnips are sown between bean or pea rows. The farmyard manure is applied to the mangold and vetch land at once from the folds, and any which is left over is heaped and carted when convenient, on to the permanent pastures, or reserved for early vetches after harvest.

Considering the size of the farm, a very large amount of purchased food and home-gown corn is consumed; £1300 per annum is thus expended, £800 of which is for bought food. It is, however, a singular fact that no manure is ever bought, either in the form of artificial or dung, Mr Treadwell preferring to keep up the fertility of his land through food consumed rather than by direct manuring.

THE LORD-LIEUTENANT OF IRELAND ON AGRICULTURAL MATTERS.

IN the course of his speech at the dinner of the Royal Agricultural Society of Ireland at Ballinasloe, the Lord Lieutenant said :—

I wish to call attention to the stock of this country, which has had such a great reputation of recent years — which produces such wealth to the country, and which is so eagerly sought for on the other side of the Irish Channel. I believe that the stock in Ireland has been greatly increasing, and consequently the wealth of the country, in regard to stock, has also increased very considerably during the past few years. I am not able to give you any statistics, but I can give you a few figures with regard to the stock of this country during the last year. I find that the value of stock in Ireland has increased over the value in 1869 to nearly half a million sterling. If we go into the subject further, we shall find that the number of cattle increased by nearly 67,000 since last year; and, what is still more remarkable, the number of pigs in this country—an important item to the poor farmer, though one which is often laughed at—has increased by 367,468. (Applause.) The decrease I now give you is shewing the number of exports from this country and Great Britain. I believe that these exports have not been much greater than former years. Up to May the trade in cattle was very brisk, but that in store cattle was very much diminished, in consequence of the almost unprecedented drought that existed. I believe I am correct in stating that in England, and especially in my own neighbourhood in the midland counties, the stock had to be fed with oilcake. As far as the farmers of the country are concerned, I think they should look carefully to the stock; for if I am not much mistaken, towards the end of the year there will be a great demand for cattle in Ireland, in consequence of the great number of ports closed up in Germany; for there is annually a great importation of cattle here from Germany, consequently a vigorous demand will ensue for Irish cattle. The question of the cattle trade is one of great importance to this country. On a previous occasion I have been obliged to allude to it, and since I have been here I have had a good deal of business to transact on the subject. I believe that the value of the cattle trade in this country amounts to over £7,000,000 a-year. Last year I referred to the Act which had for its object the prevention of contagious diseases of cattle in England. I then expressed a hope that before another session had passed the same benefits would be extended to this country. I am glad to say the same benefit has been extended to this country, and has had the effect of diminishing the amount of disease in Ireland in store and other stock; but I would also wish to draw attention to an incident which recently took place in the House of Lords, and in which a noble peer who represented Scotland endeavoured to introduce a clause which would have hampered very much the cattle trade of the country. (Hear, hear.) I am happy to say that this Government were able to resist that motion without going into a division. It shews that there is a very strong feeling on the subject of Irish cattle in Great Britain, and I was obliged, when I had the responsibility of answering the objection raised, to undertake, on the part of the Government, that we should use in this country every possible means to check the spread of disease, and put the cattle trade of the country on the same footing as the rest of the United Kingdom. Cases of pleuro-pneumonia have been reduced to eleven, which is a satisfactory proof of the condition of the stock in Ireland, and I am happy to acknowledge the great support that the Government received from the farmers of the country in connexion with the matter.

TILLAGE HUSBANDRY.

Having alluded to the stock of the country, I may be permitted to come to a subject still more important—I mean the tillage of the land of the country. (Applause.) I believe that every one who has travelled about in this country will admit that there is very great room for improvement in the manner in which the husbandry of the country is conducted. It is a mistake to suppose that if we advocate an improvement in the cattle of this country, it is our wish to diminish the tillage of the land. (Hear.) If we improve the tillage of the land there is a great demand for manure and for store cattle; but I believe every one will admit that there is vast room for improvement in this respect. Every one who goes over the country will see farms of all sizes, large and small, in a terribly backward condition, very little manure being put into it by the money of the tenant. We too often find the tenant living in a house which a stranger would hardly think fit for the habitation of his stock. The stranger would think that the tenant farmer was exceedingly poor, but I am assured that that is not the case, and that the poor man who appears not to be able to have a decent house for himself, his wife, and his children, is really a man who has a large sum of money, which he hides, perhaps, in the thatch of his house. (Laughter.) I do not know whether the story is true or not, but I was told it; and I was also informed that in the country banks of Ireland nearly £20,000,000 of money was deposited belonging entirely to the tenant farmers of this country. I say that if that money were laid out on his farm it would return the farmer greater interest than it could when lying in the banks. There is really something terribly wrong in this state of things. I know not with what truth it is said that the tenant is afraid to shew his wealth and prosperity to his landlord. I myself don't feel such want of confidence in the tenants of Ireland. (Hear, hear.) This society encourages various modes of agriculture; it encourages the growth and cultivation of new products.

FLAX,

For example, was exhibited here to-day, and we saw some fine speciment from different parts of the country. It is of great importance to encourage the growth of those products, and I think that the encouragement in this way by the Government during past years has been attended with the best results. I believe that what is more wanting, and which must precede the general introduction of a new crop, is the more general knowledge of land throughout the country. All those new crops require very great agricultural care and skill in their production. Flax requires great knowledge to select the seed, to prepare the land, and to select the rotations that should come, and other agricultural knowledge requiring great agricultural skill. I believe that the west and south of Ireland are admirably adapted for the growing of flax; but I do not expect that it will be generally cultivated until there is a general improvement in the cultivation of the country. If that takes place, I feel sure you will be doing an immense amount of benefit throughout this country. The northern merchants would prefer home flax to [illegible] Belgium and Holland, and I believe that Irish land is able to produce, and that Irish land is able to compete successfully with the flax growers of Belgium and Holland.

LARGE AND SMALL FARMS.

On another subject I desire to say a few words. It is a question of very great interest, but it has been one of very great difficulty—the subject of small and large farms. No one who visits the country can fail to observe that it is a country almost essentially of small farms. I perceive that the total of agricultural holdings in 1856 was over 600,000. Of these more than half, or 317,457, were valued by Sir R. Griffith at under £8 a-year. In Galway, out of a total number of 38,592, about two-thirds were valued at a valuation of £4 a-year; and half, or 797, were valued at £9 or upwards. Now, that illustrates a significant fact, and one to which Englishmen and Scotchmen never have specially devoted their attention. I do not intend for a moment to give a dogmatic opinion between large and small farms. It is a difficult question, and one which I will not therefore attempt to decide. If such ever became necessary, and if, of necessity, a reference should be made, and small farms had to give way to large ones, the change ought to be carried over a large period of time, in order that the political mind of the people should not be disturbed. But I am not at all prepared to go so far as that; for I believe if we look abroad in various countries—in Switzerland, Italy, Belgium, and Holland—we find small farmers working the land as in this country of Ireland. We see whole tracts of small farms where the people are not only quiet and content, but exceedingly prosperous. I think a very great improvement can be made in small farms in this country — an improvement in those small holdings which it behoves all those who are interested in agriculture to foster and promote. I will not lay down any stringent rule on the subject, but I like to see large farms in districts to which they are suited, and small farms in others. I should like to see a variety in ranges of farms suitable to the capital of the people, the tenants, and of the district in which they are placed. Now, I would like to instance our model farm, which I have recently visited—I refer to the school farms at Glasnevin under the able direction of Mr Baldwin, which are all of different forms and different sizes. It is a good thing to mention even an extreme case of success. There is a plot of land consisting of five and a-half acres at Glasnevin, and which had been in very bad condition until it was taken for the purpose of a farm. I should wish any man to visit that five and a-half acre farm, and he will then see different crops growing in succession. The produce of that farm affords maintenance for three cows, while a portion is reserved for other crops. I am told that the net produce of that farm, which is worked by some of the pupils, whose labour is equal to that of a man and a boy, amounts to over £50 per annum. I have said that this is an extreme case; but I think it is worth the while of everybody who has studied the subject to visit this farm, and to bear testimony to the admirable manner in which it has been cultivated. I do not wish to be misunderstood; I would not wish to say that these farms should be spread over this country more widely than at present; but I should wish to see a variety of farms suitable to the means and capital of the farmers and the nature of the soil. I acknowledge the energy and civilizing influence of the large farmers; but at the same time, I warmly sympathize with the small farmers, of whom the mass of the Irish tenantry consist, and in doing so I wish the prosperit and peace of the country to be increasingl secured.

With regard to the Land Bill, his lordship sai —I believe that no great question has ever bee treated in Parliament with so much generosit and so little of the bitterness of party feeling. think we may congratulate ourselves on that re sult. I think that great praise is due to tha numerous class in the country who hold respor sible and difficult positions amongst us, an who, though they may have differed from th course the Government adopted, offered n serious opposition to the proposed measur I believe it will set at rest the land agitation i Ireland. It is my honest conviction that goo landlords will not be seriously affected by th measure; that their influence will not be di minished, but rather increased, and that th influence of their order will be much greater i consequence of the checks and restriction which will now be placed on those whos conduct towards the tenants has hitherto lowere them in general estimation. (Cheers.)

HINTS FOR HOT AND DRY WEATHER.

LIVE STOCK.

HAVING sold our fat beasts, I have just purchased twenty yearlings and nine two-year-old shorthorns. These, in addition to our usual 200 sheep and lambs, are a fair supply for 170 acres of land, out of which 108 acres are in corn. But how are we to keep them this dry weather, for we have only had one good two hours' rain in Essex for near five months? I see no difficulty, so long as our chaff-cutter is at work, giving us ample supplies of finely-cut straw chaff, green beans, stems and all, also passed through the chaff-cutter; cabbage pulped, malt combs, bran, rape, and cotton cake; rock-salt in the mangers, and a never-absent supply of water. We shall add a little taste of clover, second crop, passed through the chaff-cutter; and all these mixed together, with steam and plenty of straw chaff, flavoured with a little hay chaff if you have it, it is surprising how much stock can be kept going. Then comes the question, where do we put the cattle? Certainly not in the fields, but comfortably under an enclosed and slated shed, with paved floor, the slates lime-washed with thick gruel-like lime-wash, done by our labourers. Consequently, instead of the slates being burning hot they are cold, the white lime reflecting or throwing off all the heat which would otherwise be absorbed and transmitted by the slates, to the animals' great discomfort. Th lime must be applied when first made, and it must b of a thick, gruel-like consistence. No rain will was it off in summer, but in winter the frosts will do so, and the slates will always appear new, because th hot lime-wash kills all vegetation on the slates. Thi lime-washing renders our houses and cottages com fortably cool. The outside of bricked cottages shoul also be lime-washed. There must be ample opening under the wall-plate, and ventilation in the roof by long dependent board, dividing the openings into tw parts; or, have Watson's ventilators in the roof.

There is no place so cool as under a wide-spreading, well-foliaged tree, but then you are wasting you manure on the tree, while in the shed it is all save for your crops.

By the way, talking of trees and small fields, let m entreat landowners travelling by rail to keep their eye upon every mangold or turnip crop, and reflect on thei condition, and on the ruinous loss that the trees occasion to farmers, especially in such a dry season as th present. In the centre of these small and woode fields the mangold look green and healthy; but as the approach the sides of the fields they become beautifully less until their terminus is *nil*. The thirsty root of the trees, and fences extending from 10 to 50 yard into the field, have taken all the moisture and rendered useless and unavailable all the costly manure and cultivation. And all this for what? A neighbour of mine threw down a tremendous fence, a real rasper; I bought of him two gigantic oak pollards, minus the branches, for gate-posts—they must have been at least two centuries old. I paid him 9s. for the two, the tops probably brought as much. These robbers had exercised their calling for centuries, doing a damage that in its total would be astonishing, injuring alike landlord and tenant; for they must have tended, and always do tend, to prevent that increase of rent which accompanies progress and improvement. It is only when these horrid fences have been removed, and the reclaimed ground planted with a new crop, that one can appreciate the enormity of the loss of area and of waste that has been so long inflicted and endured.

I remember finding roots as thick as cart-whips 33 yards away from the fence, and, on tracing them to their source, found that they belonged to some wretched little elms not worth 7s. 6d. each. It was only by forking under the ploughed land that we discovered them; they impeded the digging, and were robbing the ordinary farm crops of their food. As a source of profit we cannot compete with the unrented forests of Canada in wood growing; and as to the picturesque, farming is a business or trade, and by the removal of my neighbour's fences I can take an enlarged view of agriculture in more senses than one.

My iron wire fences, erected twenty-five years ago by my friends, the Garretts, are as good as new for use now, and much cheaper than insect-and-weed-harbouring and food-destroying natural fences. My sheep and lambs are all iron folded, and my experience has taught me that this is a more satisfactory mode of feeding the animals and the land than the roaming at large system.

WATER.

I am afraid that sheep are often injured or retarded by want of water. Nature in fresh green pastures has taught us that the right proportion of dry food to water is as one in four of weight. Green grass contains 75 per cent. of moisture; but when seared or scorched by a burning drought, such as we now have, the absence of a proper supply of moisture must be supplied by water; when we give cake, malt combs, bran, &c., the sheep must have all the water they choose to drink, or they will cease to eat enough to fatten them. The Cruelty to Animals Society should look into some bad cases of this kind. Well may sheep lose flesh when on "roast meat," as our farmers call dried grass. My cattle under cover always have free access to water.

One of the best things I did on this farm was by draining, from 6 to 10 feet, and thus tapping springs, to get a permanent supply of some forty gallons of pure water per minute. A previous owner of this farm bored 150 feet in the strong clay and found no water. The constant flow of pure water from my springs has been a comfort to the inhabitants along a line of brook miles below me. Animals, like our selves, are influenced in their desire for water according to circumstances, such as the state of dryness o their food and temperature of the atmosphere. To compel them to fill themselves with succulents, turnips, containing 90 per cent. of water, often at a very low temperature, is as unprofitable as to deprive them of a supply of water under an opposite condition o food.

If animals could speak to us, how often would man be reproached for a neglect cruel as it is unprofitable. The question of water is becoming a serious one. By drainage, removal of trees and fences, and by deep railway cuttings, tunnels, wells, we have rendered our soil and climate drier and warmer. The consumption of water by our steam-engines and locomotives is something amazing. One-horse power of steam evaporates every hour six gallons. The population of London use 100 millions of gallons daily, which goes into the river instead of back to the land.

A sagacious friend of mine practises and suggests a rule by which every cottage or house can be always naturally supplied with water. The average of British rainfall is 26 inches, so that a house 10 by 10, with a roof having a flat area of 100 feet would receive in the course of a year 208½ cubic feet of water, or 1251 gallons. A tightly built well or underground tank with a pump in it would receive and store nearly this quantity, provided the roof were properly guttered and troughed, and some slight deduction might be allowed ou account of evaporation and waste. Now, a roof of 100 feet flat superficial would represent a house or room only 10 feet square; when, therefore, I hear of farmers sending miles after water, when they have an enormous area of roofing which would supply them ten times over with all the water they could require in a year, I feel that landlords and tenants should combine to have proper underground tanks to receive the winter water from the at present untroughed roofs, instead of using it to wash away all the best and most soluble portion of their manure. Let me entreat my friends on high hills, porous chalk, dense clays, and light lands, to consider this suggestion, and especially all owners of cottages. Union infirmary rates will then be considerably diminished, and we shall have plenty of water for irrigation and other purposes. A bricked underground tank can be built and cemented at a very moderate cost.

By allowing the water to accumulate for a month or two before you begin to use it, it will probably never be again empty. In my case the rain-water from my roof filters through sand, gravel, and a little charcoal. This is taken out and washed clean about once in two or three years.

In our eastern counties the rainfall only averages from 16 to 22 inches. Mr Hope states that the sewage of London on the north side only of the Thames would daily fill a lake of 92 acres 3 feet deep. What would that be worth this dry weather, or indeed at any time, upon the land?—*J. J. Mechi.*

Among the Tombs.

CORDING to Lord Kames, and also, if we remember rightly, William tt, oxen are much more profitable of burden than horses. Strangely ı, however, notwithstanding all the elo- : and statistics employed by both, the s of the present day cannot see with spectacles on this subject than those hich their predecessors saw. So far as instructed by the former, nearly a cen- ;o, Lord Kames makes it out that in ırse of twelve years the

ERENCE OF EXPENSE BETWEEN OXEN AND HORSES

ɜss than £74, 4s. in favour of the oxen. s his adjuration to farmers to use cattle l of horses in the labour of the farm:—

> : is not in agriculture any other improvement ıals the using oxen instead of horses; they are tractable; and they are purchased and main- .t much less expense. As this improvement is to the meanest capacity, one might expect to y farmer greedily embracing it, as he would a ter being famished. Yet few stir. How is ɔe accounted for? Men are led in chains by ; and fettered even against their interest. why should we pretend to be wiser than our '" they will say modestly, or rather obstinately. : warms me upon this subject is the great con- ın of oats by work horses, which would be ıaved by using oxen only. Did our own pro- nish this consumption, it were less to be re- but it is grievous to be reduced to the neces- mporting annually vast quantities of oats; all h would be saved by employing oxen only in a Nor is this all that would be saved, as shall be ıed by-and-by.
>
> hat I may not be accused of declaiming with- ıdation, I am willing to enter into a candid ison between horses and oxen as employed in I begin with affirming that an ox is as e as a horse, and as easily trained to a plough t. I have seen a couple of them in a plough ; sweetly without a driver as a couple of horses; by the voice alone without a rein. Oxen, are preferable for a steady draught, as they always pull to their strength, without ever flinching; horses, on the contrary, are apt to stop when they meet with unexpected resistance. As oxen have less air and spirit in moving than horses, their motion is concluded to be slower. They are less expeditious, it is true, in galloping, or perhaps in trotting; but as farm work is performed by stepping, let the step of a horse and of an ox be compared, and the latter will be found not inferior, especially where an ox is harnessed like a horse. Colonel Pool, in Derbyshire, ploughs as much ground with three oxen as the neighbouring farmers do with four or five horses. In summer they eat nothing but grass; in winter they have hay or turnip when much wrought; straw only when wrought moderately. About Bawtry, in Yorkshire four oxen in a plough do as much work as the same number of good horses. In several parts of Kent, an acre daily is ploughed with a team of oxen; sometimes a quarter more. Near Beaconsfield, Mr Burke ploughs an acre in a day with four oxen; and his neighbours do no more with four horses. In the road from Leeds to Wetherby, I saw a loaded cart drawn by two stout horses and a bull, all in a line, the bull in the middle. That draught was not slower than those before and after in the same road. And surely the bull would not have been added had he retarded the horses.
>
> Hitherto the comparison holds pretty equal. In one article oxen are clearly preferable. Their dung makes excellent manure, and by that means they always improve the pasture. Horse-dung, on the contrary, burns where it falls, and hurts the pasture. Horse-dung from the stable has a greater tendency to burn than to rot; and to make it useful, it requires to be carefully mixed with cooler materials.
>
> But the chief advantage of oxen comes under the article of savings, which branch out into many particulars. In the first place, the price of a horse fit for labour doubles that of an ox. An ox worth £7 will perform as much solid work as a horse worth £14. This is an important article; the labouring cattle are the most expensive part of a farm stock, and it is that expense which keeps back from farming many men whose skill and industry would afford them a comfortable living. In that view, it is greatly the interest of landlords to promote oxen, as they tend to multiply candidates for a farm, which not only gives the landlord opportunity for a proper choice, but raises every farm to its just value.
>
> As an ox is cheaper than a horse, so he is fed cheaper in proportion. He requires no corn, and he

works to perfection upon cut grass in summer, and upon hay in winter. He does well even upon oat-straw. Thus by using oxen, a farmer can make money of his whole crop of oats, except what is necessary for maintenance of his family. The bulk of that product, on the contrary, is consumed by farm-horses. Even in the Carse of Gowry, the consumption of oats on farm-horses is so great, that at Perth and Dundee there are annually imported between four and five thousand bolls of oatmeal.

A horse is liable to many diseases that an ox is free from. If it happen to turn lame, to which he is subjected from many accidents, he is rendered useless. An ox may always be turned to account; for if disabled from work, he can be fatted for the shambles, and sold for more than was paid for him.

A horse commonly turns useless for work in ten years, and the stock of horses must be renewed every ten years at a medium, which is a deep article of expense to the farmer. Oxen last for ever; or, which comes to the same, they can be sold to the butcher when past the vigour of work, and their price will be more than sufficient to put young oxen in their stead.

Horses require more attendance than oxen: they must be curried, combed, and rubbed down. Let oxen have their proper quantity of food, and they require no other care. It is sufficient employment for a man to manage four or five horses; he will manage with equal ease double the number of oxen.

The shoeing of horses is no inconsiderable article. The expense of shoeing oxen is a mere trifle.

These several articles of saving are summed up in a following table, and are very considerable. This sum ought to go wholly to the landlord as additional rent. The tenant has no claim for any share; because after paying that additional rent, he has as much profit as he had formerly when he wrought with horses.

By this mode of husbandry the advantage to the landlord is great; and to the kingdom much greater, by saving the importation of an immense quantity of oats. But the advantage of oxen is still more extensive; it reaches every manufacturer, and indeed the whole people. There must be a great increase of oxen to answer the purposes of farming: every one of these, after their prime is over, goes to the shambles: the markets are filled with beef, which not only lowers the price of beef, but of leather and tallow. [illegible] upon these articles would bring down [illegible] of our manufacturers, and consequently the price of our manufactures in a foreign market; not to mention that cheap manufactures at home tend also to lower wages.

People differ in the manner of yoking oxen. In some places they are yoked by the tip of the horn; in some by the root. These modes are visibly inconvenient. When an ox draws by the shoulder like a horse, his head is free, and his motion natural. When yoked by the horns, he lowers his head to the line of the draught [illegible] his posture is constrained and his step short. His neck indeed is strong shoulder is a better *fulcrum* for the draug yoke an ox by the shoulder, his harness oug the same with that of a horse. The only diffe that as his horns hinder the collar from being over his head, it must be open below, and after it is on. The advantage of yoking an o shoulder was known even in the time of Co who says that fastening the yoke to their hor jected by almost all who have written direc husbandmen; for the cattle can exert grea with the breast than with the horns.

When the advantages of oxen for draug great, it cannot but appear strange that in oxen have almost totally been laid aside. the antients we read of no beasts for draught l It was so in Greece as early as the days of and it was so everywhere. The Dutch at t of Good Hope plough with oxen, and exerc early to a quick pace, so as to equal horse waggon, as well as in the plough. They are the East Indies for carrying burdens, and fitter even than horses for that service; the ba ox being convex, and consequently more able port a great weight than that of a horse. A necessary in the furniture for the back is a bit or stiff leather, to prevent the load from falli upon the neck. The only cause I can assign ferring horses are bad roads, which were uni Britain till lately. Being impracticable f during winter, the farmer carried his corn to on horseback. A proper furniture for the ba ox was not thought of, though an easy in And horses being thought necessary for carr dens, they were employed instead of oxen work: if employed at all, they are too expen to be suffered to be idle. Another circ contributed. Because oxen require no cc commonly imagined that they scarce require They are put off during winter with dry stra after the turn of the year affords very little ment. They become too weak for working; instead of bettering their food, it is vainly that multiplying their number will answer; may be seen in several places yoked in a pl or twelve weak animals that can scarcely sup own weight. We are now provided with go everywhere; and there is no longer the prete roads for preferring horses. Corn is now c market in carts, for which oxen are no le than horses. And it is hoped that farmer last break through a bad custom, and open t to their own interest. Nothing is more dee interest than to lay aside horses totally in far tions, and to employ oxen. The tacksma first; but does not the landlord gain mor abling his tenants in new leases to pay a hig Why, then, should gentlemen loiter, while th easily advance their rent without oppress tenants? Why do they not encourage the

ıple and precept to follow a mode that is
›eneficial to themselves and to their country?
e hard, indeed, if a single tenant cannot be
see his interest: if a landlord can prevail but
: or two of his tenants to take the lead, the
naturally follow. At any rate, he can force
ı their own good, by prohibiting horses in
w lease. It is a strange sort of ambition that
:ntlemen to spend their estates in the House
nons, where most of them are mere mutes,
›f serving their country and themselves at
hich is genuine patriotism.

n the reclamation of waste lands is
ʒ so much attention, the following
g out of the valuable catacombs of
›plement to Daniel's "Rural Sports,"
g the advantages attendant upon enclo-
ill be read with interest.

NCREASE OF RENT BY ENCLOSURE.

ı fact, ascertained by the researches of the
ıral Society, that, "upon an average, rents
bled by enclosure:" in many instances they
: times greater, as at Long Sutton, Holland
:., and in some, as Lincoln Heath, Kirkton,
:s have increased in the proportion of one to

ı forty years, upwards of 92,033 acres have
closed in twenty-seven parishes in Lincoln-
The old rents amounted to £21,490, 16s. 5d.,
r let at £72,150, 15s. 11d., being an increase,
quence of enclosures, of £50,659, 19s. 6d.
. These works cost £175,191, 13s. 11d.;
ıcting the interest of this sum from the amount
›vement, leaves an annual net gain to the
of £41,905, 8s. 11d. Upon a moderate
on, the yearly produce is three times the rent;
:e it follows, that by the enclosures in ques-
: community is benefited to the amount of
ı, 14s. 6d. annually.

neighbourhood of Belvoir Castle, a lordship
o years ago was £300 per annum, it is now
ınd an estate at Swinhop, in Lincolnshire,
by the Rev. Mr Allington, which sixty years
›r £95, now lets at £960.

ıcrease of individual revenue, powerfully as it
:s the immediate parties, is of the least import-
›ugh when proceeding from a proper source,
to much weight as a national consideration.
:en demonstrated, that infinitely the greater
ıe commons, or, as they are well denominated,
:s of England, are wholly unproductive; and
›e self-evident, that even the best of them
: more beneficial, if properly cultivated, than
de state in which they have long remained.
ıtion of enclosure, therefore, extends beyond
ns immediately connected with the commons;
ses the community, which, in obtaining more abundant and more reasonable sustenance at home, would retain several millions of its specie, which is at present annually exported to foreign countries.

The enemies of enclosures have made the cause of the lower orders of the people the pretext for their hostility. We should be amongst the first to resist an attempt to augment the estates of the affluent by depriving the peasant of his scanty property; but the reverse, in this instance, is the case: every man's right of commonage is at present defined, and the interest of the rest sees that he does not exceed it; (which, by the way, is the spring of eternal quarrels and litigation), whilst, on the other hand, instead of the liberty to turn a sheep, if he can buy one, to famish upon a wretched pasture, he obtains his acre, more or less according to an established and equitable ratio, in which he has a perpetual and real, though not an extensive property, yet still great to him, and sufficient with good management to largely contribute to the support of his family; whilst the improvement of this little freehold attaches him to his country, and creates an interest in its well-being.

The above reasoning carries conviction of its propriety; and the improvement of waste districts might perhaps be forwarded, by permitting them to be free from (if, when enclosed they are liable to) the payment of the land-tax. It would be a boon to the proprietors, and the views of Government would be promoted, by waving a right, when the object is of such evident advantage to the welfare of the community.

FARM AND GARDEN WORK TWO HUNDRED YEARS AGO.

From "Systemæ Agriculturæ" we extract the following directions as to the month's work in farm and garden:—

THE FARM.

In thirsty July would the parched earth be glad of a moistening shower, to refresh and revive the scorched vegetable. Now is there an equal care taken to avoid Phœbus—his bright and burning beams, as in the winter the furious blasts of cold Boreas. Tempests now injure much the laden fruit-trees and standing corn, to the great detriment of the husbandman.

Now is the universal time for hay-making, lose not a good opportunity, especially if fair weather be scarce.

Mow your head-lands, thryfallow where the land requires it; gather the fimble or earliest hemp and flax.

At the latter end of this month corn-harvest begins in most places, in a forward year.

Still carry forth marle, lime, and other manures; bring home timber, and fuel, and other heavy materials.

Wheat and hops are now subject to much damage by mildews.

Now sow turnip seed.

GARDEN AND ORCHARD.

It is now a principal time for the inoculation of choice fruits, roses, &c.

And for the summer pruning of your wall-trees, for the making of cherry wine, raspberry wine, &c.

Cut off the stocks of such flowers that have done blossoming, and cover their roots with new fat earth.

Sow sallad herbs for later salading, and also peas.

Take away the snails from your mural trees.

Slip stocks and other liguous plants and flowers, and lay gillyflowers and carnations for increase, watering them, and shadowing them from the fervent sunbeams. Lay also myrtles, and other curious greens; clip box and other tonsile plants.

Graff by approach, and inoculate jasamines, oranges, &c.

Transplant or remove tulips and other bulbous roots, some may be kept out of the ground, others immediately planted.

HOP GARDEN.

If the season prove very dry, the watering of the hops will very much advantage them, and make them the more fruitful; if it prove moist, renew and cover the hills still with fresh mould.

APIARY.

Now bees cast their latter swarms, which are of little advantage; therefore, it is best to prevent them.

Straighten now the entrance of your bees. Kill the drones, wasps, flies, &c.

We extract again from Daniel :--

NATURAL CURIOSITIES.

In March 1798, in a wood in the parish of Salehurst, in Sussex, a gamekeeper of Sir John Lade's shot a woodcock, completely white; and in November, the same year, Mr Goodyear, of Box, Somersetshire, killed one with both its wings white.

Near Younghall, a yearling calf drinking in the River Blackwater, was seized by a pike, which was drawn out of the water before quitting its hold. On killing the fish, a water-rat and perch, entire, were found in its stomach. The pike weighed 35 lb.

The longevity of the pike is truly remarkable, if credit may be given to the assertions respecting it. [illegible]zaczynski speaks of one ninety years old; but Gesner's pike that was taken near Hailbrun, in Twabia, [illegible] 497, with a brazen ring denoting that, from the [illegible] of the Governor of the universe, Frederick the [illegible] 1230, places the [illegible]ancy.

[illegible] Muller, two hares [illegible] gloss, and in the [illegible] was taken; these much exceeded in bulk the common kind.

We are told that an eagle having pounced upon a weasel, mounted into the air with it, and was soon after observed to be in great distress; the little animal had extricated itself so much from the eagle's hold, as to be able to fasten upon the throat, presently brought the eagle to the ground, an the weasel an opportunity of escaping.

We take the following interesting e from Daniel's "Rural Sports," as our g ing from the *Tomes* this week. It is ab

LONDON AND ITS AGRICULTURAL FO

n the last century and the beginning o present, about which some remarks wi found in another column :—

That London has largely added to its Inhab the Reports on the Population and Consumpt England fully prove. It is as follows :

The Resolution in the Committee of Agri introductory to the Bill now pending in Parli for inclosing the Waste Lands, were to the foll effect :

1. That much of the Country, though Impro is still Waste.
2. That this Improvement, with the ensuing age and Division, might be facilitated by a C Law.
3. That this Improvement is wanting, as one of providing for an Increased Population Quantity of indigenous Bread Corn, hitherto being insufficient for Home Consumption.

The very interesting Document in Support Position, that the Population is increased, at London, is adjoined.

It is an account of the Sales in Smithfield M from the year 1732 to 1794, both inclusive.

Years	Cattle	Sheep
1732	76,210	514,70
1794	109,064	717,99

It is to be observed also, that the Size and both of Cattle and Sheep, have probably incre least one-fourth since 1732; according to whicl the Consumption of Meat, per pound, has augr besides the Addition in point of Number.

The Increase every Ten Years since 1732.

	Cattle
Consumption in 1794	109,064
Increase, compared with the	
Consumption in 1784 (10 years)	10,921
Ditto in 1774 (20 years)	18,645
Ditto in 1764 (30 years)	33,896
Ditto in 1754 (40 years)	34,774
Ditto in 1744 (50 years)	32,416
Ditto in 1732 (62 years)	32,854

Consequently the Increase, in 62 years, am the enormous Number of 32,854 Head of Cat 203,290 Sheep for the Metropolis alone.

The Average Weight of Oxen killed for the Market, A.D. 1700, is 370 lb.; of Calves, 50

8 lb. Now, 1812, the Oxen weigh 800 lb. 'es 140 lb., the Sheep 80 lb., and Lambs rally about 50 lb.

January 4th to December 30th 1808, there 1 at Smithfield, beasts, 152,660, Sheep and ,045,210, Calves 17,750, pigs 34,110.

ging the Cattle at Twenty Pounds, the Sheep nbs at Forty Shillings, the Calves at Fifty s, and the Pigs Forty-five Shillings each, returned in Smithfield Market will be

	£	s.	d.
52,660, at 20*l*. a-piece	3,053,200	0	0
nd Lambs 1,045,210 at 2*l*. do.	2,090,420	0	0
7,750, at 2*l*. 10s. do.	44,375	0	0
110, at 2*l*. 5s. do.	76,747	10	0
Total..........	£5,264,742	10	0

oregoing, does not, however, give a perfect the Animals brought to the London Markets, ze and fine Condition should be seen by a to enable him to judge of the Extent of the ption.

urious Calculation upon our Internal Economy the Subsequent is mentioned.

nan Being is supposed to consume Annually luce of rather more than three and one-eighth land—namely, half an Acre for Bread, one-f ditto for Beer, Cyder, &c. one-fiftieth ditto etables, and two-and-a-half ditto Animal food ne of which each Person, on an average ion of ten Millions, is computed to devour). imated that there are in England and Wales, oo Horses for Labour and Pleasure; and that rith Colts, &c., require for their Support, o Acres of Land. In the County of Middle- number of taxed Pleasure Horses, in 1797, ,266; for Agriculture, &c. 12,709—Total,

Metropolis consumes Butchers' Meat, to the of Seven Millions Sterling Yearly. A Calf, he London Market, is stated to consume as Milk, as would make a hundred weight of

The number of Sheep in England and Wales, g to the Evidence given on the passing Wool eeds forty Millions; of which including three s of Lambs, about fifteen Millions are killed y.

following is a correct List of the number of Sheep, &c., slaughtered in London only, the last three Months :—

nd Lambs	346,629
....	32,000
....	13,475
died and killed	2,657

uld be remarked that, in the last three Months laughtered than in any other Quarter of the

Proportion of Land cultivated for different Purposes, in England and Wales :—

	Acres.
Wheat	3,160,000
Barley and Rye	861,000
Oats and Beans	2,872,000
Clover, Rye-grass, &c.	1,149,000
Roots and Cabbages, cultivated by the Plough	1,150,000
Fallow	2,297,000
Hop Grounds	36,000
Nursery Grounds................................	9,000
Fruit and Kitchen Gardens cultivated by the spade	41,000
Pleasure Grounds...............................	15,000
Land depastured by Cattle..................	17,479,000
Hedge Rows, Copses and Woods	1,485,000
Ways, Waters, &c.	1,473,000
	32,027,000
Common and Waste Lands	14,889,000
Total Acres in England and Wales	46,916,000

The total Annual Produce of 46,916,000 Acres is estimated at 126,720,000*l*. which costs, in Labour, Artificers, and Horse-keep, 56,720,000*l*., leaving an annual net Increase of 70 millions sterling; of which the Landlord is supposed to get forty-two parts, Taxes and Tithes, thirteen, and the Farmer, fifteen. This latter Allotment we presume to have been made at a Period, infinitely less productive to the Farmer, than the present.

Other Articles of Sustenance for the People of London may be here noticed, the Herds of Milch Cows in its Vicinity excite Surprize in Foreigners, yet few of them suspect the Amount of the Consumption of Milk, which is not less than 6,980,000 Gallons Annually. The Number of Cows kept for this supply is Eight Thousand five Hundred. The Sum paid by the Retailers of Milk to the Cow-keepers is given at 240,833*l*. per Annum, on which the Retailers lay an advance of Cent. per Cent., making the Cost to the Inhabitants 481,666*l*., not content with the Profit above stated, a Sixth part water is added on an Average. The Circumstances relative to the Adulteration of Milk, ought to be added to the list of petty Frauds, which not only affect the Pockets, but the Health of the Purchasers. When the Nobility and Gentry are in Town for the Winter Season, Deterioration of Milk is at the highest, during the Summer Months, when such families are mostly in the Country, it may probably be of rather a better quality. The Milk is always given in its genuine State to the retail Dealers, and is sold to them under Twopence halfpenny per quart for which they obtain Fivepence, this Profit is surely large enough to prevent, even the smallest Incitement to adulterate it, and much is it to be lamented, that no Mode has been yet devised, to stop the many Impositions practised in the Sale of this necessary Article of Life.

The Yearly consumption of Wheat in London, is about Nine Hundred Thousand Quarters, each containing Eight Winchester Bushels. This Essential Commodity, has been and is liable to numerous equivocal Causes, for its full or scanty Appearance in the London Market. From a letter which appeared October, 1811, in the Newspaper published at Boston, Lincolnshire, the Extract is taken, and the Author seems to Explain many points that influence the Value of Bread-Corn, to the general Consumer. In the diffrent remarks which have fallen under my Notice, upon the subject of the Causes for the Dearnes of Corn, the Writers have not appeared to preserve a proper distinction, between the Intervention of bad Seasons, and the progressive Advance in Price, after the most plentiful Harvests. Last Year is acknowledged to have been abundant, for quantity and quality; still the price averaged nearly one-third more than it did a few years ago. It must, therefore, be presumed, that there are some operative houses existing, which have not been sufficiently attended to—and the common worn-out Topics to excite Discontent, have been revived against the private Merchants (as combining to advance by a Monopoly, the Scarcity)—who by the Stocks they occasionally hold, are enabled to consign Corn at a considerable Risk, to those parts of the Kingdom, which consist of large Manufacturing and populous Districts, and whose consumption exceeds their own Produce, or to support the enormous Population of the Metropolis. The private Merchant in the Country is regulated in Buying, by the Prices of Mark Lane, which is, to him, and the Grower, the general Corn Barometer. The Fluctuations which that imperious Market is subject to, are affected by the daily Supply, and in doubtful Seasons is agitated by public Opinion, which is often corrected by the Exertions of the Merchant who engages in large Importations, and thereby checks the Impulse of Speculation, and thus while in pursuit of his particular Advantage, he benefits the whole Community. But the most mischievous Interposition proceeds, from the vast Demand of the Public Contractor, who not only dictates the price to Mark Lane, but intercepts in the country those liberal supplies which would otherwise be more than adequate to the regular Demand and Consumption. After the dire continuance of so wasteful a war, it is impossible to be at a loss to account, for the progressive dearnes of the Necessaries of Life, which will become more oppressive to the whole country, the longer it is persevered in. The natural Value of the Produce of the Land, will recoil upon the possessors of the large hereditary landed [illegible] the present rents as if [illegible] been frequently [illegible] has taken place in the price of Wheat, there has been no proportionate Reduction in that of Flour. When Wheat has sold at a trifle more than Ten Shillings a Bushel, Flour has been so high as fifteen [illegible] honest cause can be assigned for the Difference, no Pretext of Scarcity ca be urged to palliate the Extortion : it is barefaced, unqualified Fraud and imperatively calls on the Legislature, for Retribution and Redress.

Mr S. Wyatt, in his Depositions before the Co and Flour Committee of the City, some Years since stated a Belief, the Result of Sixteen Years Experience, that "Flour might be sold Eightpence pe sack lower than the average price of Wheat (allowing for the Expense of Carriage, and if ground upon th Spot, the difference might be still greater: even i the long frost of 1789, the Albion Mills furnishe Flour at Seven Shillings and Eightpence per Sack below the average quarter of wheat." Mr T. Woolhead, formerly a Cornfactor on the same occasion, wa examined:—"A few opulent Individuals (said he have the entire guidance of the market, and return t the Meal-Weighers, what Price they please for Flour this Price is generally regulated by Sales to the necessitous baker, who is obliged to come with part of hi money in his hand, by way of advance, when he want Flour, and is told it is such a price, being often a extortion, and this is the Price given to the Mea weighers as the *bona fide* Sale, by which means th Assize of Bread is frequently Augmented."

The Agricultural Society in one of their Reports says, "Very little of the best Flour is sold alon Most of the Bakers are in Debt to the Mealme they have not the power to choose the best, bu at equal Price are compelled to take seconds and in many cases, Such a Mixture, as th Mealmen may think fit to offer. There are Pe sons who suppose, that the Adulteration by Mixtur of various kinds of Meal, even Bean-meal, forms t greater part of the Mealman's Profits; as it is noto ous that the Mealmen buy different kinds of Gra and that a large Proportion of the Bread sold as t best Wheaten Bread in London, is at least one Ass or Twopence in the Peck Loaf under Bread of t Quality. The Importation of Foreign Corn i England in 1810, was 2,221,951 Quarters. If t immense quantity be turned into Money it will amo to more than Eight Millions Sterling, the Grea Part of which, was thus carried in specie out of t country.

"The good old times," which are prais up by many, often without warrant for t adjective *good*, and which are run do by as many for being altogether lacking energy, in comfort, and skill, were p haps neither so good or old fogyish, they have been painted. Indeed, they se to have been quite as much alive, 200 ye ago, to the comforts and amenties of life we are at present, as will be seen by the f

rticle, explanatory of the frontispiece
ema Agriculturæ:"—

THE EXPLANATION.

st your eye upon a rustic seat,
rong and plain, yet well contrived, and neat,
uated on a healthy soil,
g much wealth, with little crop or toil.
y it stand the barns, framed to contain
ng stores of hay, pulse, corn, and grain ;
rtons large, and places where to feed
oxen, cows, swine, poultry, with their breed.
other side, hard by the house, you see
iary for the industrious bee.
on a little farther, and behold
sant garden, from high winds and cold
led by a spreading fruitful wall
ows of lime, and fir trees straight and tall,
aught with necessary flowers and fruits,
ature's choicest sorts of plants and roots
d the same are crops of beans and peas,
, and liquorice, or such as these ;
orchards so enriched with fruitful store,
e could give nor they receive no more,
ree stands bending with the tree it bears
rries some, of apples, plums, and pears ;
r from thence, see other walks and rows
ler fruits, near unto which there flows
ing stream ; the next place you discover
re St Foyn, la lucern, hops, and clover
opagated : near unto those fields
a large wood, mast, fuel, timber yields.
der vale hard by the river stands
er-engine, which the wind commands,
ilize the meads ; on the other side
ian wheel is placed both large and wide
same intent ; then do the fields appear
d with corn and grain for the ensuing year.
The pastures stocked with beasts, the downs with
sheep,
The cart, the plough, and all, good order keep ;
Plenty unto the husbandman, and gains
Are his rewards for his industry and pains.
Peruse the book, for here you only see
The following subject in epitome.

TO THE GENTRY AND YEOMANRY OF ENGLAND.

SIRS,—To you is dedicated this succeeding tract, and for your sakes principally doth it submit itself to the censure of this critic age. It is a bad time for so mean and rustic a subject to appear, when every shop and library is replete with the fruits and labours of the most acute wits. Yet I hope with you it will obtain its end, in this opportune season, when, by the great plenty, and smallness of value of the ordinary productions of the earth, so many of your tenants exercise in only the vulgar methods of agriculture, are forced to withdraw their hands from the plough, and revert their tenements into your own possessions, that you yourselves may cultivate that which is your own, and you that continue in your farms may, by your industry, manage them after the best and most advantageous ways for the propagating of such things that we are most deficient of, and that may most retaliate your cost and industry, and most improve your lands, not only for the benefit of yourselves and property, but the kingdom in general. The several ways and means to accomplish the same being here presented to your view ; for which end, and no other, these experiments and observations have been, not with a little care, composed and contracted into so convenient and brief a method, and in such a familiar style, suitable to the apprehensions of those they most concern. That they may answer your expectations is the desire of

J. W.

Papers by Tim Bunker.

NO. L.—TIM BUNKER ON THE "HORN-AIL."

"WHAT is the matter with your cow, Mr Frink?" said Seth Twiggs, as he leaned his elbow on the barn-yard bars, and looked benevolently at a very spare and hirsute animal, that Jake was milking.

"Can't tell exactly," said Jake. "Guess she's got the horn-ail, or some sich thing."

"I thought the trouble seemed to be in her legs, when she come by my house last night. She walked kind o' totlish," said Seth, knocking the ashes out of his pipe.

"Wall, that might be. Horn distemper generally affects 'em all over. Had Tucker up here to doctor her last night; he said it was horn-ail."

"What did he give her?"

"He gin her a slice of salt-pork, split her tail, put in salt and pepper, and bored her horns."

"Rather guess there was some squirming."

"Yes, it took three men and all the ropes in the barn to hold the old keow."

"Don't you think horn-ail hurts the milk?" inquired Seth, hesitatingly, as he re-lighted his pipe.

"Wall, as to that, I can't say. It's all the keow we've got, as gives milk, and I shouldn't think any trouble in the horns would strike clean through the beast. Milk is milk, I take it, no matter where it comes from. I never could see any difference in the taste."

"I rather guess milk won't be milk out of that animal much longer," said Seth, ominously, and blowing a puff of smoke as blue as his prophecy.

"[illegible] don't think she's going to die, do you?" [illegible] solemnly.

[illegible] already held a counsel on [illegible] told me so last night [illegible] told me he [illegible] [illegible] [illegible]

[illegible] conversation [illegible] [illegible] upon the carcass [illegible] said [illegible] said he had human feelings, and [illegible] in a cow he had milked, and he [illegible] want to put her in a muck heap. [illegible] neighbour due credit for the feelings [illegible] which the death of his cow seemed to call forth. But I could not help thinking that a little more of that tenderness manifested to the animal while living would have been much more wisely bestowed.

To tell the plain truth, the animal died of starvation, just as many cows die every year in this land of Christian civilization. I noticed the cow last summer, and told Jake he would certainly lose her if he did not give her a better pasture. But he would keep her with his young cattle in the old cow-pasture that has been grazed to my certain knowledge for fifty years, and probably for a hundred, without ploughing or manuring except the droppings of the pastured animals, and these were yarded at night. He kept six animals where there was not grass enough for three. They came out of the winter poor and thin, and this cow having the drain of milk upon her system grew thinner through the summer. The winter diet of bad hay and an occasional turnip, cut short the work of starvation, and fulfilled Tucker's prophecy.

They have a great variety of names for this process of torture in different parts of the country. Sometimes it is horn-ail, or worm in the tail; again it is slink fever, or murrain, black leg, or black tongue, cattle disease, or pleuro-pneumonia. It would not do for an intelligent, civilized man to see and believe that he starved his cattle to death. Conscience might trouble him, and possibly some of his neighbours might have him before the courts under the statute which prohibits cruelty to animals. If I were called to judge in such a case it would certainly go hard with the offender. It certainly inflicts more pain upon a brute to starve, than to beat [illegible] The whip upon ribs well lined with fat is a [illegible] torture soon over. But to keep a cow [illegible] the stack-yard through the cold stormy nights [illegible] winter, to give her poor food, and not half enough of that, is a lingering torment, more cruel than that which the savage inflicts upon his victim bound to the stake. The poor beast can only [illegible] through the hollow ribs and the bristling hair, and these signs of woe are usually attributed to disease rather than to a lean manger.

This is an evil that legislation will not reach, and I suppose nothing but public opinion will ght, and that probably not in our day. d seem that there was no need of losing ock under ordinary circumstances. I ept cows for over forty years, and they ll died by the knife, proving as useful namental in their deaths as in their lives. arving of animals is so unprofitable that s no apology for it. A half-starved cow pays for her keeping. A well-fed one handsome profit.

recipe for the horn-ail is, one good warm well ventilated and well littered, one bushel rots or beets daily, hay and water *ad* , one card or currycomb, and gentle treat- I have never known this dose to fail of ting the disease.—Yours to command,

TIMOTHY BUNKER, ESQ.

.—TIM BUNKER ON A "COMMENTARY" ON ROOTS.

should like to know what upon airth you your cattle to make 'em look so slick," ke Frink, as he looked into my yard on a April morning.

w to 'em, you fool," exclaimed Tucker, uffs 'em with ile cake and corn, just as ould a sassage!"

n mighty glad I don't have the bills to said Jones. "That animal has cost £10 inter, I'll bet a pound; and 'twouldn't sell t neow." "Don't be so sure of that," said Twiggs, as he joined the company at the nd looked admiringly at Cherry, who had ed her third calf a few days before. "I want of a new milch cow, and will take that price without the calf."

u will have to add ten more to get her, I even if I want to sell," I remarked very y, as I shewed a pail half full of milk after lf had taken all he wanted to suck. "But e I never sell a new milch cow. Making and cheese is my business, and milk is ock in trade. A shoemaker might as well s leather, or a tanner his hides, as a farmer new milch cow. The dairy farmer, who is eye teeth cut, will sell cows only when are well fattened, or at the close of the g season."

ut s'pose he has mor'n he wants," said inquiringly, as he loaded his pipe.

e has no business to be in that fix," I re- "He raises a given quantity of hay and r, straw, roots, &c., and he ought to know ow much it will take to bring them out in condition in the spring. If he has only fodder enough for twenty head of cattle, he makes a great mistake if he keeps twenty-one, and is foolish if he attempts to keep five-and-twenty. With food enough, he will make a profit on each; with too little, he will lose on every one."

"'Lose *every one*,' you ought to have said,' interposed Seth, with a knowing wink at Jake Frink for his recent experience with the horn-ail.

"Cherry," I continued, "is what I call a living *commentary on roots*. Mr Spooner has a good deal to say about the opinions of different commentators on this and that text from which he preaches. I always thought that the best commentary on a man's faith was his *practice*. His life shews well enough what sort of food his mind lives on, and it is pretty much so with fodder. There's a good deal of truth in the old adage 'The proof of the pudding is in the eating.' The kind of pudding my Cherry has lived on all winter is turnips, mangolds, and good hay. Not an ounce of meal, upon the honour of a gentleman, and she gave milk until within two months of her calving. You see, now, she is as sleek as a mole, with a bag as big as a milk pail, and a fine calf."

I put the case to my neighbours, Mr Editor, in that way, and made them see it. I know a good many farmers say roots don't pay for raising, that they are all water when not frozen; and if they are frozen, you might as well feed you cattle on snowballs. I know that the chemists say that they are more than three-fourths water, and not worth half as much as hay, which may be true enough. But what do I care for these opinions, so long as roots make flesh and milk cheaper than anything else I can raise? I am after milk and flesh by the cheapest method, and if giving water to the stock will bring them, I shall give them water, Jake Frink and Mr Retort to the contrary, notwithstanding.

White turnips stand particularly low in the scale of nourishment, and yet Cherry had white turnips, a-half bushel a-day, until they were all gone, and gained flesh upon them. She did better on mangolds; and for that reason I think they are worth more, and if they could be raised as cheaply as turnips, I should prefer to raise them.

My rule is to raise all the roots I can, of the several varieties, so that every animal may have a daily feed of them from November until May. They like a variety of food, and with hay as a staple, I think the greater variety the better, feeding, say two weeks upon one kind, tl taking another two weeks. Many think they can get more fodder from an acre of land in grass than in roots, but this is a mistake. I have raised all the roots usually cultivated for feeding, and I come to the bottom of every spring with a stronger conviction of their value. *The living commentaries* tell the story a great deal better than I can, and some of my neighbours have got the lesson. Deacon Smith learned it before I did. Mr Spooner got hold of it early, and he always drives a fat horse, that goes round the parish preaching carrots, where-ever he calls, just as plainly as Mr Spooner preaches election in the pulpit. Now I have nothing again' Mr Spooner in the world, and I don't mean any reflection on him when I say that the old horse has more "unction" in his preaching than anything we have in Hookertown on Sundays. There hasn't been a rib in sight since he has owned him, and when he drives up to the door on Sunday morning the horse comes up with a prancing gait, and a coltish air, that says "carrots," as plain as if Mr Spooner had a bag of them under his carriage seat. I don't talk such things on Sundays, but you know a man can't help thinking.

And there is Seth Twiggs, whose brains one might think were all smoked out, has got ideas straight as a ramrod on roots, and raises heaps of them every year, though he has but a few acres of land. Even Jake Frink is waked up by the preaching of Mr Spooner's horse, though he never hears the man—except at funerals. He goes in for a crop of mangolds this season, for the first time. Tucker and Jones are not yet converted, but I am expecting even they will be brought in before long.

One of the advantages of the root crop is, that it may be put in late. Swedes and carrots may be sown without any detriment any time in the month of June, white turnips a month later, and the first week of June will do very well for mangolds. This last is the most productive of all the roots. The "commentaries" on roots are multiplying here.—Yours to command,

TIMOTHY BUNKER, Esq.

[illegible] THE BACKGROUND

"[illegible] corn this," said Patrick, as he threw the [illegible] sheaf on to the threshing machine.

"'Taint nothing to what I've seen over on the Island when I used to live there," said Uncle Jotham, with a look that would have annihilated anybody but an Irishman.

"An' how much d'ye think ye've seen over there, old fellow?" asked Pat, determined to sift matters to the bottom.

"Eighty bushels to the acre of clean corn, and nothing used but fish manure neither."

"An' sure that was some corn, but the Squire will have a hundred bushels as sure as ye're born.

"There won't be seventy bushels," exclaimed Uncle Jotham, "to the acre on any part of the Squire's farm, I know."

"You must go over to neighbour Frink's to see corn," remarked Seth Twiggs, drily, as he sat on his milking stool at the end of the heap, puffing away with his pipe, while his hands were busy with the ears.

"Now, Jake, own up," said Tucker, "and tell us whether the crop on that lot was ten bushels and three pecks, or three bushels and ten pecks."

"It was plump twenty bushels, and no thanks to you either," said Jake indignantly. "It is enough to make any man go astarn to have such a hand to work for him as you are. The weeds grew faster than the corn, a mighty sight."

Jake Frink's corn field was certainly the poorest piece in the neighbourhood, and if there is any poorer in town, I have not seen it. It wasn't so much because the land was poor naturally, for his farm joins mine, and there can't be a great deal of original difference in the soil. His corn field and mine were not a quarter of a mile apart, but there was a good deal more than that difference in the yield. Tucker probably made an under-statement in putting it at ten bushels and a fraction, but there could not have been over twenty bushels, and one-third of that was soft corn. It was hoed only once, and the crop of wild mustard and wormwood was very generous. Grass was so plenty that Jake's crows found the best pasture upon the corn field.

"What is going to be the price of mustard this fall, neighbonr Frink?" inquired Seth Twiggs.

"I don't care," said Jake, "I sha'nt have any to sell. It makes tol'able fodder."

"You'll make beef on't, I suppose," remarked Tucker, very gravely.

"How much profit d'ye spose ye've made on that crop?" inquired Uncle Jotham.

"Profit!" exclaimed Jake. "I don't farm for profit. I'm thankful enough if I can get a livin'. I've always had a hard time on't, and this year have run astarn a little more than common."

"And where do you 'spose the leak is, in your pocket?" I inquired. "Wall, now I can't tell," said Jake, scratching his head. It seems as if the trouble was at the top of the pocket instead of the bottom, and I've been always trying to find out why money didn't get into my pocket. Mine always gets out before it gets in, so that the most of the time I don't have nothin.' I've always been runnin' astarn since I begun to farm it, and I don't know what the matter is."

Jake's puzzle is that cf a good many others, though few, it is to be hoped, are quite so bad off as he is. They do not make any headway but are rather getting in debt every year. Many have to sell out and change their business, or emigrate to where the land has not been so long abused. There is something in Jake's insinuation that bad help is the cause of bad crops. This is apt to be the case where the employer is not in that field himself with his hands for a large part of the time. I have never yet seen a farm that would thrive without the constant oversight of the owner. Farming necessarily confines a man at home as closely as any other business. There are occasions of loss every day in seed time and harvest, if he is away from home. But Jake's trouble is not here, for he does not hire much help of any kind, and what he does hire is a fair average of farm help.

One thing that makes him run astern is the want of all system in making manure. He does not feel that this is an essential part of a farmer's business. He does not make one load where he has the material to make ten. An empty barn-yard makes a barren corn-field. This makes a man discouraged, and he does nothing promptly and with a will. He runs astern in every crop through the season, and in his pecuniary affairs at the end of the year.

But this is not all the trouble with my neighbour. Jake is not what he ought to be morally, and this, perhaps, lies at the bottom of his poor farming, as is the case with a multitude of others. It takes something more than a strong body and a sound mind to make a successful tiller of the soil. Manhood is as much an element of prosperity in this as in any other calling. If a man goes to the village and haunts taverns, nothing will save his business from disaster.

TIMOTHY BUNKER, ESQ.

NO. 53.—TIM BUNKER ON THE FARMER'S OLD AGE.

"Sally Bunker Slocum is the baby's name," said Mrs Bunker, as she took off her spectacles, and laid down the letter from Shadtown, which I had just brought in from the postman.

"I like the name well enough, except the spelling of it," she continued. "Sally was my mother's name, it is my name, and my daughter's, and if they wanted to keep up the name in the family, I don't see why they didn't spell it in the old way. If I set out to do a thing, I would do it right."

"I suppose it is a little more genteel," I replied. "That is the way they spell it among the aristocratic families here."

"That is just what I don't like," said she. "It is a miserable affectation of women who read novels more than they do their Bibles. We have no aristocracy up here, and judging from what I saw when I was in London, I never want to see any. I don't want to see any aristocratic trumpery on my grandchildren. Sallie won't look well on a grave stone."

"What does Sally write about it?" I asked.

"Not a word about the spelling. She seems to think it is all the same. She writes: 'We carried the baby out to church for the first time last Sunday, and it was baptized Sallie Bunker. We never thought of calling her anything else, out of regard to you and grandmother, though we did not tell you at the time you were here, lest you should be too much puffed up with your honours. She is a nice child, and little Timothy thinks a world of her.' That is all she says about it. I shall write her immediately," said Mr Bunker, with emphasis, "that my name is not Sallie."

Now we do not always agree on small points, but on the larger matter of having grandchildren, we see pretty much alike. It is one of the greatest comforts of old age to have children's children around us, to cheer us while we live, and to bear our names and to take our places when we are gone. We can hardly have too many of them, and I shall not be very particular whether their names have a letter more or less, if we only have the children.

This is a matter of considerable solicitude, not only here in Hookertown, but in a great many farm houses around us. The present generation is getting pretty well along in life, and we do not know who is going to take our places. You would be surprised to see how few young men there are at the church on Sunday. The men who sit at the head of the pews are almost all grey haired, and some of them are about as white as snow.

We have got things fixed up pretty comfortable, and it will be pretty hard to go off and leave them, but we might say that, I suppose, when we start on a longer journey. We can't expect to stay here for ever, and a few years more or less won't make any particular difference with us when we get into the promised land. Most of us here in Hookertown have kept old age in view for a good many years, and I guess we are about as comfortable and jolly a set of old people as you will find among your hundred thousand readers. We have most of us got good houses that keep us just as comfortable and entertain our friends as well as a house that rents in the city for £200 or more. Twenty acres of woodland that you have watched the growth of for forty years or more, is about as good as any bank stock I know of. I suppose I could sell the timber on any acre of mine for £50, to say nothing of the fuel. The same land cost me only 5s. an acre. Perhaps some folks who are in such a mighty hurry to cut off their forests might as well stop and cipher a little.

And while I am talking of trees as a shelter for old age, I want to say a good word for orchards, apples, and indeed fruits of all kinds. I waked up to planting apple trees when I was young, and I think I have now about as good an orchard as there is in the county. With the low price of fruit this last year, it has brought me in over £40, sold on the trees to the buyer. I only regret that I had not begun to plant pear trees sooner. They are quite as hard as apples, yield as well, and sell for more than double. A man with a dozen acres in pears, of the right kinds, would have a comfortable income for old age, if he had nothing else. But aside from profit, plenty of fruit in the family is a great comfort and luxury, and an important means of health. We have seen very little of the doctor in forty years, and we have fruit in some shape every day in the year. Put these two thing together: long-lived people eat much fruit.

Perhaps we don't live quite so well out here on the farm as some of the nabobs in the city, though about that there is room for difference of opinion. All the raw materials of their extra luxuries come from the farm—poultry, eggs, milk, cream, butter, and cheese, and the fine fruits. They have better cooks, perhaps, though some of us out here have things about as nice, in that line, as it is safe for sinners to enjoy. I should be loath to swap my cook for the best you have got in your biggest hotel. When Mrs Bunker gets on her checked apron and spectacles, and lays herself out on a soup or a roast, you see, common cooks might as well retire.

In the matter of dress, we in the country are not quite so independent as we used to be, when there was a spinning wheel and a loom in every house, and men wore the linen and woollen made at home, because they had nothing else. But we clothe ourselves easier now, for we can buy cloth a great deal cheaper than we can make it. But if prices keep going up, we may have to go back to homespun again, and then I guess the old folks will be about as independent as any body, for we know how to use the spinning wheel and loom. But that day is some way off, I guess, judging from the finery we see in Hookertown church on Sunday. That two-storey bonnet of Miss Almeda Georgiana Bottom has done the work for our young women. They tittered at it at first, but it was no use laughing at the fashions. They had to cave in, and the church on Sunday now looks like a big flower garden. The old ladies who were freest in their remarks, I notice, have bonnets as fashionable as the highest. I suppose I should not have said so, but I couldn't help asking Mrs Bunker, as we started for meeting, if she would have the carriage top let down.—Yours to command,

TIMOTHY BUNKER, ESQ.

The Garden.

VIOLETS.

"VIOLETS! blue violets! fresh sweet blue violets! Buy a bunch, sir? fresh gathered; only a penny, sir!" Such are the pleasant cries that greet the ear in spring in London and most of our large towns. The violet penetrates everywhere, carrying much of the sweetness and purity of the pure air and sunny skies of the country into the very heart of our crowded cities. There's no garret stair so high that it cannot climb, no cellar too dark and deep for it to reach down into. This flower is the common property of the race. The rich and the poor gather and enjoy it together. It gladdens the young eyes of childhood and lights up with a tender lustre the dimmed eyes of the aged and dying. Not only the flowers, but the plant itself goes everywhere. The gardens of royalty would be shorn of half their sweetness if wanting their violets. It is often the poor man's only possession. Like the one ewe lamb in Bible story, it is his treasure—his pet—his playmate—his all of his vegetable kingdom—the one green link that binds his town-smoked, labour-soiled, and, it may be, sore-stained heart, to nature and God. It helps to bridge over the great gulf that poverty, toil, sickness, and, it may be, sin, dig out into impassable barriers between town and country.

The violet is a domestic plant. In all temperate climes it has preceded, and is ready to greet us with its sweet welcome. It is almost impossible to travel beyond its range. It hugs the snow line, and, if shaded from the glare of the sun, may be enjoyed within the tropics. Our climate is admirably adapted for its cultivation, and it is largely grown, though neither so largely nor so well as it ought to be. Of late years it has received more attention. Now we have had several additions, old and new, to the family. We have violets large and violets small, violets sweet and violets scentless, violets blue and violets white, violets lilac and violets red, violets with horns and violets without horns, and violets single and violets double. The Viola odorata, and the varieties of sweet violets, are the most useful, and it is of them that I purpose writing at present. Among single violets perhaps the Czar is the very best. The stalk is long and the flower large, which makes it very useful for forming into bundles and bouquets, or arranging in vases. It stands well up above the others. The single blue Russian is perhaps the next best. The King is also a very good violet. The single white is useful for variety. Purple or red violets I consider useless. The colour seems incongruous. Lilac, blue, and white seem redolent of perfume. Even yellow seems out of place in the odorata section, however much we may

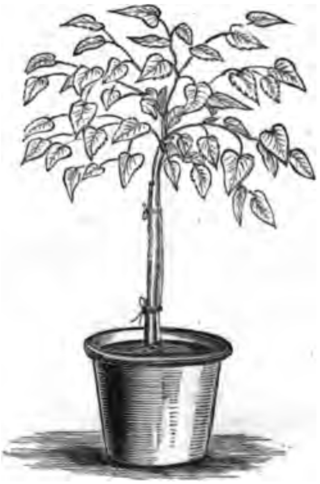
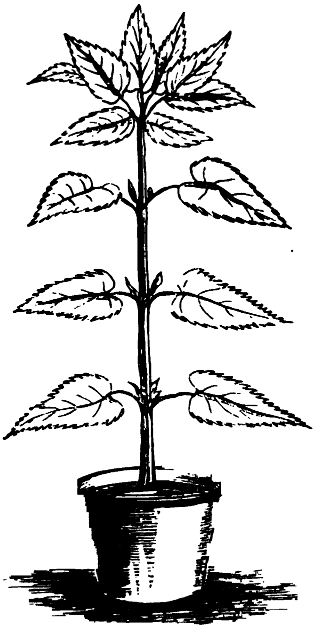


Fig. 1.—Mode of training a Tree Violet.

admire the Viola lutea, or the endless shades of yellow in the heartsease or Viola tricolor. But we need not discuss this matter, for we have not yet been favoured with a yellow or primrose Viola odorata.

Amidst double violets I rank the Neapolitan first. The perfume is inimitable, and the colour such a soft lilac, or lavender, just made to exhale its peculiar odour. It is a universal favourite. It is more tender than any other sort, but will stand the winter well in most sheltered localities. What is called the Tree violet stands next in order, though I have grave doubts whether it is anything different from the double blue. Certain it is that all violets, single or double, may be converted into so-called trees by simply rooting the lower or stem end of the runner, and tying the little plant at the end of it up to the top of a stake (see fig. 1), instead of allowing it to root in the ground as it would do if



[illegible]

[illegible] wall [illegible] violet many storeys high, train up [illegible] wall or stake (see fig. 2), then a second and a third runner in the same way from the preceding year's crown every year in succession, until a ladder is needed to gather the violets from the upper storeys violet attics. If you wish for a long trunk, cut a layer of branches off ever as you raise your new branch. To f

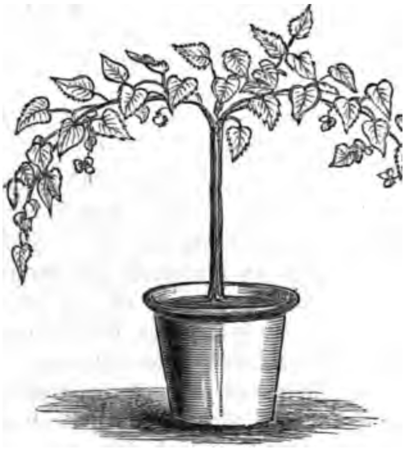


Fig. 3.—Mode of training a Weeping Viol

Weeping violet (see fig. 3), run you up to the desired height, and then all runners on the top to weep down eith gularly or over a trellis at pleasure. Al forms prove sources of interest and p to villa gardeners with plenty of time mand. The illustrations will sufficient cate how we desire the plants to be tr

But if you want to gather a maxi sweetness with a minimum of labo trouble, and for a long season withou mission, keep the young violets where meant them to be—on the top of earth. Treated thus the lilac violet b the double lilac, perhaps a little large the double blue is a noble violet wh grown. The Queen of Violets is a g provement on the old double white, b much larger. There are a good man called sorts, but these afford s variety, and suffice for all practical pu Neapolitan is the best double an blue, and double and single white. however, six of the three former to the latter. Whites are only useful shing to the lilacs. We dress w latter and trim with the former. intimate cultural and decorative fa of twenty years' standing with violet

shapes, and sizes, I have to say that
o grow the above varieties in the pro-
ndicated, will not lose their reward.
ow are we to grow them ? Every
a few violets in the garden, but
ther but few. I have seen a bed of
an violets that never grew a good
of flowers in a dozen years, and
her sorts have yielded but few
In fact, the best violets I ever saw
se bought in the streets of London
ovent Garden Market. They were
at is really the best word for it), so
bstance and plumpness, as if they
ve been eatable, and withal so
l sweet. Violets are cultivated for
kets of London and other large
They are very often left to live or
ey list in some overshadowed, out-
y corner in small gardens. In such
the violets wear out a leafy exist-
ey can grow nothing but leaves, till
ese become so weak and helpless,
, thrip, and red spider eat them up
nd the violets disappear.
hief things that violets need are
food, light, and water, and an annual
of their youth. What is mostly
d is, that violets need a great deal
h, food, light, and water; they don't
ng up crumbs of such things, they
e a full meal. This is just where the
s made. The villa gardener throws
mbs of heat, a ray or two of light, an
manure, and a drop or so of water
lets, just as he would a bone or two
dog. You cannot have good violets
ay. In the summer they may be
a northern aspect, but not under
n early autumn they should be
in the full sunlight. During their
riod of growth they should have a
ok into the blue sky. The violets
and spring are but the condensed
mmer's sunshine let loose again to
d gladden us when the days are
, and the nights long and dreary.
ts make no violets then, they simply
hat they have already made and
fely up within their knotted armour.
The violet has thus to do double work in summer. It grows and it makes next year's flowers. The number, size, and sweetness of the latter will depend upon the amount of heat, food, light, and air enjoyed or commanded by them during the previous summer. Surely more need not be urged in favour of a liberal regimen.

But the chief cultural secret of success yet remains to be noted. Most other perennial plants flower many times. To have violets in the greatest perfection, the same plant should never flower but once. This is the rock on which all small violet growers founder. They seldom, if ever, renew their beds or patches; the same plants linger on the same spot year after year. This must be wholly changed if a full harvest of sweetness and beauty is to be gathered in. There are two ways of annually renewing violets—by runners and seed. The latter can only be applied to the single varieties, and practised in the southern counties. The seed must ripen early, and be sown as soon as ripe, and the plants pushed on fast on rich soil, to secure well-ripened crowns before the autumn. When all these conditions can be secured, there is no readier or more certain method of growing fine violets than by an annual crop of seedlings. Under more unfavourable circumstances the seedlings might be grown two years, the full harvest of flowers being reaped the second season. But this mode is a loss of time when compared with increase by runners, as the latter are generally strong enough to flower perfectly the first season.

Perhaps the simplest mode of this procedure is to break up the violets the moment they are out of flower and well water them. In a fortnight or three weeks the runners will be well rooted. Then remove them to a rich piece of ground, and plant out in rows 1 foot apart and 9 inches from plant to plant. Let the planting be done, if possible, in showery weather. But should this not be practicable, give the plants a thorough soaking into their new home. They must never be allowed to flag, or thrip, red spider, and mildew will tread upon the heels of drought, and check or ruin the plants. Some of the varieties, especially the Neapolitan, will manifest a tendency to yield a second crop of runners. All these must be instantly pinched off. No diversion of force should be allowed. One crown only, and that as large as possible, is the secret of whole handfuls of sweet violets on each plant by-and-bye. Keep clear of weeds, and allow the leaves fair play to raise this crown higher and higher as the season advances. Towards October, the forcing and feeding treatment, must be modified or arrested. If the crowns are prominent and the leaves beginning to ripen, all is well. If not, withhold water, and thus hasten maturity. As a slight check may be given by removing the plants to their blooming quarters without a good ball of earth attached to the roots, this must be done with a spade or large trowel, taking up a piece of earth adhering to each plant, so large as not to disturb or expose the roots, but as little as possible. If plants are removed early, the removal will help to complete the ripening. Presuming that they are quite matured, the removal of plants to their blooming places may be deferred till November. Planted in warm sunny nooks or corners, they will begin to bloom at once, and go on flowering until the end of March.

November is also the best time to pot the plants for flowering in rooms, glass-houses, &c. The extra warmth will make the violets spring forth into beauty immediately, and nothing can be more pleasant winter companions than pots of violets in windows or on mantel-shelves of dining-rooms. A small pit or frame or a few of Rendle's Protectors, filled with [illegible] perpetual plants will yield such a harvest of winter violets, as few could think possible unless they have gathered them. The Neapolitan and the double blue, are especially worthy of the protection of glass in winter. Under glass the plants can be packed as closely together as they can stand, as here no growth is wanted. The plants have only to unfold their beauty. Such treatment prolongs the violet season and enables us to enjoy the freshest, purest, sweetest violets when the outside world is mantled with snow-wreaths, or the struggling violets outside are tied hard and fast to their frozen leaves by the iron fetters of frost. The biting cold robs them of their sweetness as well. Under such difficulties it is quite refreshing to turn from the outside violets battling with the elements to those blooming in security and safety within. It may be but a fancy, but I do think that violets gathered from under glass in winter are the sweetest of all violets. Can it be that they are grateful for our extra care and distil an excess of odour as our recompence? This much is certain, no plant better repays us for a sheet of glass in winter than a well-prepared violet. Let me not, however, be misunderstood. Violets, with the exception of the Neapolitan, are perfectly hardy, clothed from top to bottom in a weather-proof shield. The general stock needs no protection. If frost tread in its career so that it cannot expand its flowers, the plants can wait; for the violet is patient as well as sweet. If it cannot bloom to-day it bravely tries again to-morrow. The one certainty is, that prepared as here pointed out, it will bloom sweetly and finely enough some day to the supreme delight of its fortunate possessor.—*D.*

SUGGESTIONS FOR PLANTING TREES IN SMALL GARDENS.

THE judicious planting of trees in small gardens is a subject which, on first thought, seems uncalled for; notwithstanding, it is one worthy of a few practical remarks, from the circumstance of seeing so many residences injured in consequence of the proximity of the trees to the outer boundary walls or fences. When villa grounds are first laid out, it is not unusual to plant a row of trees to secure from view the villas on each side, or to hide a public road bordering the outer wall or rail. On large policies a double or even a triple row of trees may be conveniently planted, and kept at a proper distance from the boundary line; but on small villa properties we too often find trees placed within 10 or 12 inches of the outer fence, sometimes even nearer, and within 8 or 10 feet of each other. Some of the intermediate trees may be removed in time. The practice of thinning when the trees are interfering with each other has often a tendency to throw additional vigour into those left, and from their proximity to the wall or rail, is certain to injure it. The effect of this is to be seen by the walls in many instances being pressed out by the annual growth of the stem or roots, and in others by heavy gales of wind causing the stems to rub against the wall or rail, to the injury of both.

If trees must really be planted in such places as those described, they ought all to be of good kinds and few in number, and placed at such a distance from the boundary fence as will give them a chance of growing unmolested for many years, instead of being forced to remove them just when they are beginning to prove a shelter as well as pleasing to the eye. The distance such trees should stand from the walls ought not to be less than 3 to 3½ feet, as shewn at A in fig. 1; but if it is really intended to remove these trees when the stems become about 18 inches in circumference. they may be planted closer than 3 feet. The original idea, however, is very rarely carried out, and they not unfrequently remain till damage has been done. If the wall is deeply founded, the roots will accommodate themselves to it; but if shallow, they often get below the foundation, and, owing to their annual growth and the yearly increase in the circumference of the stem, they are apt to raise up and slightly press out such walls.

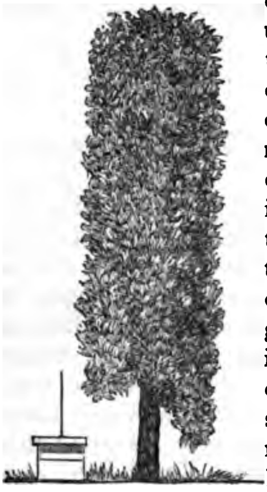


Fig. 1.

It is quite possible to side-branch certain trees, as is frequently practised with the lime tree in many parts of England and on the Continent. This practice is not always to be commended, except in cases where a screen is required, and little space afforded for it.

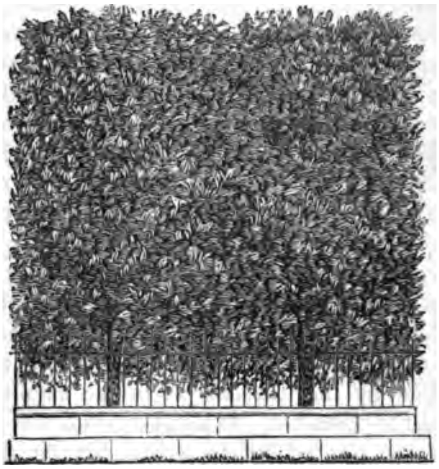


Fig. 2.—Sketch shewing effect of proper Planting.

The lime tree grows very freely, and is capable of being cut into any shape, and stopped at any height or breadth that may be thought advisable; that is, if an annual clipping of the branches be resorted to.

In several instances known to me, the boundary fence of a public road, consisting of a dwarf wall and rail in front of a row of villas, when first erected, was perfectly straight, but after a space of thirty or forty years has become quite waved. The heaving up caused by the roots, and the outward pressure by the stems of such trees as Lombardy poplars, limes, planes, and elms, all free-growing sorts and kinds usually employed for such purposes. The ultimate effect of proper tree planting and proper tree culture, or the distance between plant and plant, and from the boundary line, is well represented by fig. 135.—*J. M'N.*

GREENHOUSE CLIMBERS—TACSONIA VON VOLXEMII.

THE number of plants suitable for trellising in greenhouses is so extensive, and their attractions are so varied, that it may seem somewhat invidious to attempt to rank them in the order of merit; but although the relative degree of beauty must always remain to a considerable extent an open question to be decided by individual tastes only, it will readily be admitted by all that Tacsonia Van Volxemii stands very high amongst its compeers, to possess certain distinctive qualities which secured for it a position in popular estimation to which comparatively few of such subjects attain.

This climber was introduced into Europe by a Belgian traveller, Mr Van Volxem, whose name it bears, and who found it growing in great luxuriance in New Grenada, where it is known by the name of Coursuba.

For producing immediate effect in the decoration of the conservatory it has no equal, the marvellous rapidity of its growth, under good treatment, being such that it will cover a considerable space while the plant is still comparatively in its infancy, while the [illegible] star-shaped blossoms are produced in great profusion. The management required by the Tacsonia is of the simplest possible character. It may be grown well in pots or planted out in a bed, but for the purpose of decorating the roof of a conservation the latter system ought to be adopted. It will thrive well in a mixture of peat and loam or loam and leaf mould of the very [illegible] possible texture, with a free admixture of broken brick-bats or potsherds. Copious supplies of water at the root, and frequent syringing during the growing season are indispensable, and will be found to conduce more than anything else towards the production of healthy foliage and luxuriant growth.

The blossoms which are produced from the axil of each leaf are sometimes over 5 inches in diameter, of a lovely dark rosy crimson tint, and from their pendent habit, are most effectively displayed where the plant is, as it ought always to be, trained to the roof of a conservatory. The effect produced by them is most peculiar, from their being so gracefully suspended by a fine hair-like stem about a foot long, and so very fine in texture, as to be hardly distinguishable at a little distance: thus giving the flowers the appearance of being suspended in mid-air.

The temperature of a common green-house will be found amply sufficient for the successful cultivation of the Tacsonia, which has been found to grow very luxuriantly out-of-doors during the summer and autumn months in some parts of England, though not sufficiently hardy to withstand the severity of winter. Though not nearly so coarse in foliage and growth as most other Tacsonias, it is still strong enough to be greatly benefited by having the more gross shoots cut well back, which will have the double effect of keeping the plant well furnished at the base, and of providing a more abundant supply of young flowering shoots.—*J. Lorimer, Bradford.*

GLASS WALLS FOR HORTICULTURAL PURPOSES.

XIMUM amount of shelter, with a inimum amount of shadow, and the ossible area of wall surface on the possible space of ground, are among valuable boons offered to the culti- glass walls. In building walls of one, concrete, or even timber, we raise a dark shadow proportioned to —that is, the height and breadth of We lose not only the space occu- he wall, but a great portion of that thus shaded behind it. It is, in a sense, a renewal of the old contest light and heat incident to the old- l modes of building glass houses. s gained in shelter was lost in light. tion of every opaque wall makes the of probably one-half of the light. k of the wall and the back of the each side of the wall must remain in kness. Darkness means weakness ble, just as it enfeebles animal life. and light, on the contrary, go hand In the want of light, perhaps, most seases that plants fall heir to is, in a traceable. Plants against opaque prived of free motion in the external backed up against dark shelter, l power becomes enfeebled through motion and want of light. We can evise a remedy for the immobility of ainst walls. They must be station- they need no longer be in the dark. lls, while sheltering plants from the d providing them with a comfortable ng support, will allow the light to each side of the plant. In a word, lls will support without breaking, ish shelter without shade. They will ble us to increase to any extent the our walls on a limited space. The adows thrown by walls have com- heir being placed wide apart, and mall gardens has limited their number. In many instances it has been impossible to have more than one, and that the outside wall, for fruit culture. Another wall would cut up the small garden into a succession of shadows, on which nothing tender could grow. But these walls, being wholly or semi-transparent, whole blocks of them may be placed together, within a few feet, in graduated heights. Or they might be all made of one height, and the two ends filled in with glass walls also, thus shutting out the wind. Not only would such a disposition of glass walls economize ground, but it would offer rare facilities for protecting whole blocks of them together by a horizontal spread of netting or bunting in the spring, when the buds or blossoms were in danger from frost.

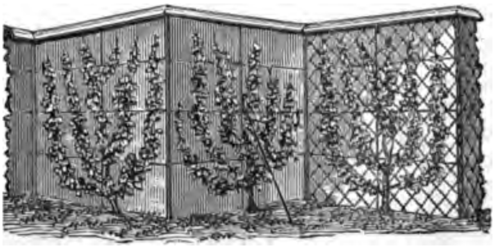


Fig. 1.—Beard's Patent Glass Walls.

These walls may also be built in zig-zag lines, as in fig. 1, which would economize space, and provide every variety of aspect within the smallest compass. Such lines may be formed at any desired angle, flat or sharp. Such zig-zag lines could also be erected within a few feet of each other. Arranged in this way, they would furnish almost any amount of wall space. Such economy of space is not only invaluable for training or fruit-growing purposes, but of great importance in forming divisional lines between gardens. In villa residences, especially, the space appropriated by walls becomes a serious matter. At intervals of very few yards a foot or more of ground is thus wasted. These glass walls will stand upon about one inch of ground. And they will constitute the most elegant and useful walls of division between gardens that have ever been offered to the public. They may be had perfectly transparent if desired. But the glass mostly used is rough plate, weighing about 26 oz. to the foot; and although it is pervious to light, it is not very readily seen through. When covered with vegetation on both sides, it would be sufficient for all purposes of privacy as between gardens.

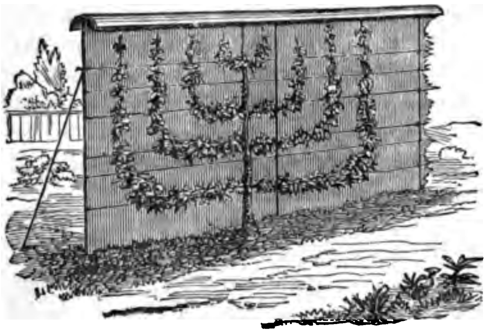


Fig. 2.—Beard's Patent Glass Walls.

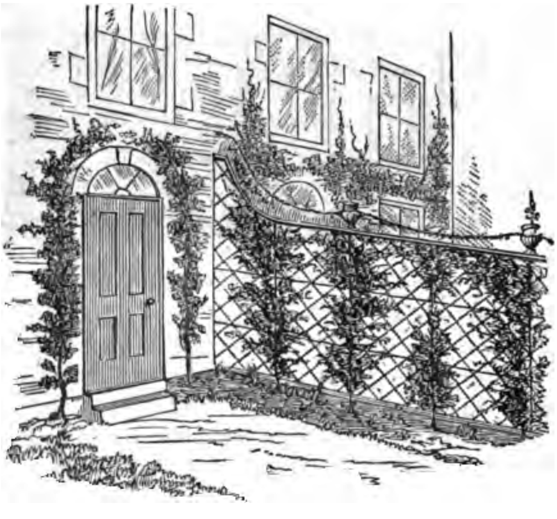


Fig. 3.—Beard's Patent Glass Walls.

Brick walls are so very heavy and ugly, as Mr M'Nab has already pointed out. Living screens again, are hardly sufficient for a boundary line, besides exhausting the ground to no profitable purposes on each side of them. But glass walls form a mode of separation, [illegible] screens of graceful elegant trees or flowers, at one and the same time, while they stand upon about an inch of space. Without protection they will be somewhat colder at night than the usual opaque walls. Glass radiates heat, and it cools rapidly. But plate glass, from its thickness, retains the heat longer than thin perfectly transparent glass. But for the culture of many fruits, probably this cooler and more uniform temperature may prove beneficial. And very tender fruit, such as peaches, will need protection on glass walls as on all others. But the lower night temperature will keep the trees later in coming into flower. All this will be so much gain. Fruit trees in the spring need to be held in check by cold, not excited by heat. Every day added to the delay of blossoming increases the chances of a crop of fruit. Heat destroys more fruit crops than cold. A few hot suns beating upon brick walls, makes the flowers come out with a rush to become, alas, very often food for frost. If glass walls will keep the trees later, which I believe they will, then there will be all the better chance of a full basket at harvest.

Glass walls will prove easy of erection, clean, and strong. Held together in a framework of iron, rendered elastic by the intervention of felt, they are strong as a cattle fence. The glass plates abut against each other, and the surface is clean and even (see fig. 2). It will be difficult for insects to find a lodging on these walls.

Besides their usefulness, which cannot be called in question, they form beautiful walls of separation. Confronting the villa, as shewn at fig. 3, they appear to be as ornamental in their way, and to quite as much advantage, as some of those pictorial fire-screens that call forth so much admiration in-doors. How delightful and pleasant it must be for our villa gardeners to have walls of apples or peaches or pears shutting out the less seemly objects that often come in contact with the eye from the point where beauty ought to reign supreme!

y are easily erected and taken down. felt, and glass bolted together, and l on a wood, brick, or stone base, or let the earth, and iron coping fixed over p, with wide-meshed galvanized wire d on to the surface, and the wall is for use.

posing you leave your garden next carefully unfasten your trees, unhook netting, remove a few bolts, and your r flower wall resolves itself once more into a bundle of iron, a crate of glass, a ball of felt, and a roll of wire netting. You take possession of another garden, and in a few hours your glass wall is glistening in the sunshine and covered with trees. This portability is a new feature in walls, nd of the highest importance to all tenants.

It only remains for us to add that these walls are offered complete at less than the price of ordinary brick walls.—*D. T. Fish, F.R.H.S.*

A CHEAP FRUIT-HOUSE.

grow good grapes or peaches, it is not necessary to erect costly houses. are deterred from speculating in what d "Hothouse building," because of the at the house must be like what they een at my Lord Tom Noddy's, at the , or Squire Allworthy's, at the Park. the outline of the houses is modern. alls are built of stone, and the "courses" wed and finished to please the fastidi- ye. The wood-work is of the best tion, and is elaborately moulded and d, and the glass is strong and clear—1 oz. to the square foot. The venti. apparatus is upon the most improved, is called self-acting, system, so that ole house, by the slightest manipula- s ventilated now, or shut up again, ing to the will of the party in charge. ths are of the finest polished slabs of nt or slate, and the cisterns of the naterial;—all beautiful to look upon, as well as useful agents in the history of fruit growing. Pipes are introduced, in sufficient quantity, to raise the temperature to any given heat; and then the boiler and the stoke-hole, and the stoking tools are all faultless in their way. Then, as if to add fuel to the fire of impatience, the economist sees a trellis, for the vines or peach trees to be trained upon, distended stiff as fiddle strings, and running through wrought-iron frames, that are again suspended from each rafter, in order to keep the leaves of the plants a proper distance from the glass. He sums up all these details in his own mind, and truly estimates the cost as something bordering upon extravagance. Loth though he may be to forego the benefit of sitting under his own vine tree, he consults his purse, like every true economist, and now and for ever dismisses the thought of having such a thing as a fruit-house about him.

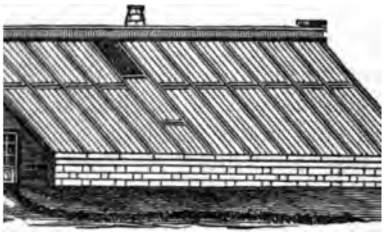


Fig. 1.—A Cheap Fruit House.

We wish to disabuse that class of such an unfavourable bias, and to shew its members that houses can be raised and finished at one-fourth of the cost of all that projected fruit-house, made up of so substantial and beautiful details. It is no new thing cheapness in hothouse building; it quite took the fancy of the late Sir Joseph Paxton, because he well knew the rock that many foundered upon, and wished to shew them a way of escape. Mr Rivers, of Sawbridgeworth, too, the pioneer of orchard-houses, set the example, by utilizing the beech and privet about his nursery, making them the walls of span-roof houses, and only introducing such young timber as spruce and larch, to nail the wall plates upon; and by this means got up houses at an amazingly cheap rate. Living walls, however, are not so good, in point of detail, for forcing or growing purposes, as dead walls. There are always insects associated with indigenous plants in the slightest approach to confinement; and that is one of the most important enemies the small garden has to cope with; and very often, notwithstanding every antidote applied, is not sufficiently overcome. On that account alone, we prefer a dead screen of some kind. The roots of living plants won't stand cribbing and confinement. They will bore through brick walls and interstices, and live like lords among the choice pabulum prepared for vine and peach-tree feeding. Then, there are the ground vineries of Mr Rendle, which is a more modern idea still, and seem, from the number of testimonials we have seen, to do all that is declared for them.

But we present this cheap house to our readers as being useful for many purposes besides growing fruit; of husbanding stock in winter, for instance, and being made available for anything in the plant or fruit way about a garden. If there chance to be a wall available, as is very often the case, to secure privacy and seclusion, then it may be said the nucleus of a house is made and ready. All that is needed are a few hundred bricks for front walls, as it will be necessary to have at least 2 feet of wall above ground, and 3 feet below ground; for the artificial border that has to be made, taking drainage and altogether, will require to be of that depth. Then the roof is made of sashes in two divisions, each alternate one of the upper range being made o slide down for purposes of ventilation. The rafters, if they be of good red pine, need not have much of the work of the joiner upon them; and the glass centre 15 oz. to the square foot, which will do quite well in any house not much exposed to wind. The ends of the house, if extreme economy be an object, may be as represented in the engraving of boards; but a little more money will make it a more useful and a better looking house, if made of the same style as the roof. No pipes are needed for fruiting a crop, either of grapes or peaches, and a wooden gangway will serve the purpose of a more expensive stone-path. Brick cisterns fixed up with Roman cement, sunk into the ground, are quite first-rate for holding water, and will last as long as a far more expensive cistern of lead or stone, or of any other material.

A little management is needed in early spring and late autumn, to make the most of solar heat. No artificial heat being introduced, the next best move is to give plenty of air during fine weather, and to shut up the ventilators as close as possible *early* in the afternoons. The husbanding of solar heat by this mode is wonderful, and tells with much effect upon the growing and ripening crop. It is necessary in vine culture to get well-ripened wood for a following year's crop; and this is the way to go about it. If peaches, or nectarines, or plums, or apricots, or figs be grown, less heat will do and more air is essential. A close-confined atmosphere with anything approaching to dryness is fertile for generating that vile enemy, the red spider. It works no end of mischief, and sulphur-fumes and water washings, are the best antidotes for barring the door against its approach, and making its quarters as uncomfortable as possible, even if it has made an insidious raid.

We hope, by drawing attention to economical fruit protectors and climates, that many of our readers may be induced to try their 'prentice hand at fruit culture; and we promise them every assistance in the way of advice that it is in our power to give.

NEW PLANT DESIGNS.

WE have to thank Mr Robinson for the following illustrations, taken from his "Alpine Flowers," formerly noticed. As Saxifrages and Sedums are so very useful for garden decoration in many ways, we may state that those referred to were taken from the general collection recommended, and not from the select lists, which buyers will find particularly suitable for rock gardens in the admirable and instructive work itself.

Beds of succulents are the "newest thing out" in fashionable gardening. At Battersea, Mr Gibson, the very able superintendent, has something good to shew the great London public every year. His sub-tropical garden is quite a study in itself; and the gardener of twenty years ago is completely overwhelmed at seeing what used to be called stove plants, growing, in great luxuriance, in prepared beds out of doors at Battersea. But we don't mean to touch upon tall sub-tropical gardening just now; we have a good suggestion to put in possession of our readers, as to the arrangement of succulents. Fig. 1 will give some idea of the charming effect of an arrangement of some sorts named and noticed in course. In that form, as engraved, it is best laid out in choice, well-kept parterres, or in a flower garden of geometric design. To have raised centres of succulents, and panels of other colours to brighten and lighten up the design, in a long border, is grand, and commands attention from its extent, and the sort of mosaics which the stiff succulent-looking plants in groups in some measure represent. To place such a design in the centre of purely natural scenery, where great old trees and clumps of rhododendrons, and bowers covered with Traveller's Joy, and honeysuckle, and ivy, were predominant, would not be in very good taste. But in villa gardens, where square and rule are observable every foot you take, the introduction of something of this kind would be very desirable.

This is quite a simple bed, made up of simple things easily got, easily propagated, and only wanting taste and enthusiasm on any lady or gentleman's part to secure. In the first place, the outline of the bed is convex, and rendered so by the heaping up of earth as a convex ground-work. Next is the planting, and the material is first, Echeveria metallica, with its stiff prominent leaves, arranged in rigid precision by the law of nature, as may be noticed in the centre of the design. Around that come multitudes of a very good border plant called Silverbracts, (Pachyphytum bracteatum), then the pretty rosette edging is Echeveria secunda. Now what a gem of a bed this makes throughout the summer months on a selected piece of lawn well kept! Only, to secure the plants, there must be frame accommodation, with a little artificial heat. With this, any lady may have lots of succulents; for their propagation is easy, and quite a lady-like operation to proceed to do. Some of them, such as Echeveria metallica, require the heat of an intermediate house safely to winter, but the other two do with less heat, and as noted above, are easily increased.

Prepare a bed of light sandy soil, with the sand preponderating on the surface. Break off leaflets of your Silverbracts and of your Echeverias, and insert them lightly in the sand, as some do, with gloxinia leaves, and these and other succulents anxious to shoot away life in earnest again, on their own account, push out rootlets and soon have little dominions of their own. If the stock of them be too limited for attempting any design on a large scale, then use them, as some do, as carpet material for taller individuals to spring away from. In this way they would form a delightful ground-work for standard roses, or for any small choice weeping plant that was selected as an individual in any appropriate design. All such things require a circle of earth as it were set into the grass, and clothing of this kind would please the eye much.

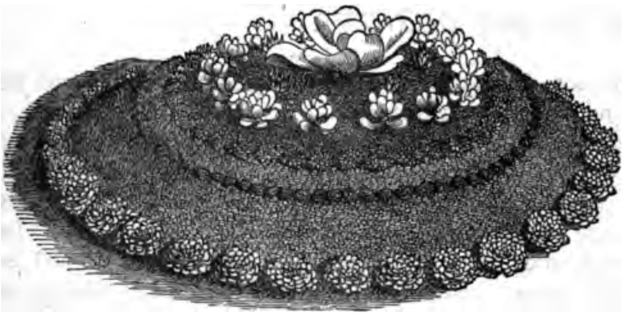


Fig. 1.—Design for a Bed of Alpine Succulents.

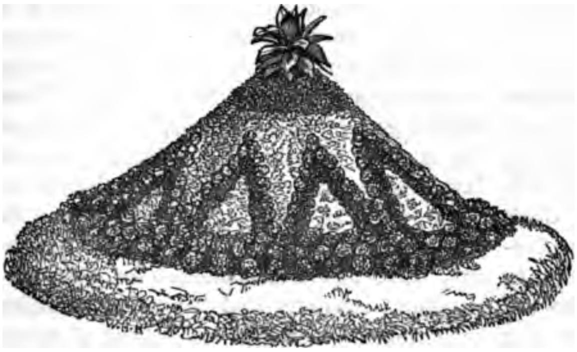


Fig. 2.—Design for a Bed of Alpine Succulents.

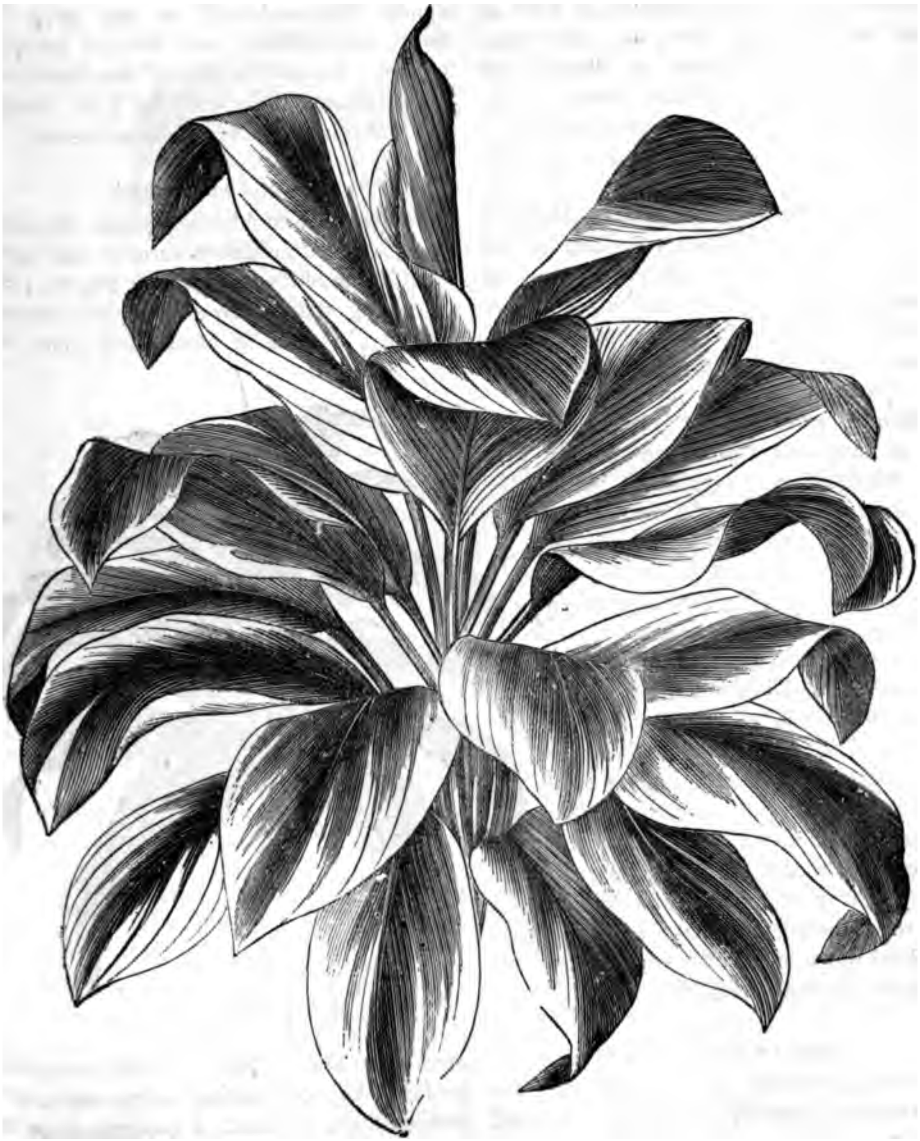
It is not necessary, as any reader on looking to the engraving (fig. 1) can observe, to have tall plants to make tall beds. Stature can be imitated by raising the ground work, so that the eye may have to look both up and down to be in possession of details.

Here is a bed of these Alpine succulents made up of somewhat the same material as fig. 1, only arranged after a different style. There is no limit to imaginative beauty, and hence the variety sought after and nature called in to fill up the prospective beauties of the skeleton design. To our thinking, fig. 1 is far more elegant, more æsthetic if you like, and would become various positions much better than fig. 2. Only, there they are, the one now under criticism being crested with the dwarf American Agave and triangles of Echeveria secunda arranged around the steeps of the mound. Contrasted for example with masses of such plants as the silvery Catsfoot (Antennaria tomentosa), and the sea-green Sedum (S. glaucum), the effect is quite telling, and looks quite as grand in its way as the exquisite dresses that adorn the ladies, and, of course, the ladies themselves, at any "drawing-room," during the height of the season.

NEW AND RARE PLANTS.

DRACÆNA REGINA.

IF majesty of character, beauty of variation, and freedom of growth, are considered queenly points in plant cultivation, then the subject which is engraved is well worthy of such a dignified distinction. The undulating character of the leaves as they unfold themselves into full size, is very marked,



Dracæna Regina.

and gives a graceful centre to an otherwise beautiful habited plant.

It is an object among horticulturists to carefully tend such plants as contrast well with others of less decided tone, and therefore the Dracæna family is largely drafted upon because of their conspicuous tints. Not only so, but all the members of the family submit to an uncommon amount of sufferance. The treatment which they often receive, even in general plant establishments, is such as would be killing to ferns, to some other foliage plants, and even to certain soft wooded plants. We all hail, therefore, any novelty in the way, if it be only as good as, and distinct from, existing species or varieties.

The Dracæna regina is one of Mr J. G. Veitch's discoveries when travelling in the South Sea Islands. In its young state we looked upon it as quite beautiful, but as we watched its progress in the Veitchian establishment, and saw it grow and grow until it became of adult size to be in condition to exhibit at our great shows, both at home and abroad, we were not only delighted but captivated by its well developed leaves in respect of form, and marked variation of colour. The broad prominent white margin that surrounds the deeply shaded green interior of the leaf, is highly attractive, and characterises the species at once for distinctness and decidedness. Beautiful as our engraving is, it fails to give a true idea of this novelty. The fortunate possessors have proved that it will stand fluctuations of temperature equal to the best of those already in commerce, and then it grows along so rapidly that young plants of tiny size soon reach dimensions that the novice [illegible] or a certain age, wher[illegible] young stil[illegible]

[illegible]

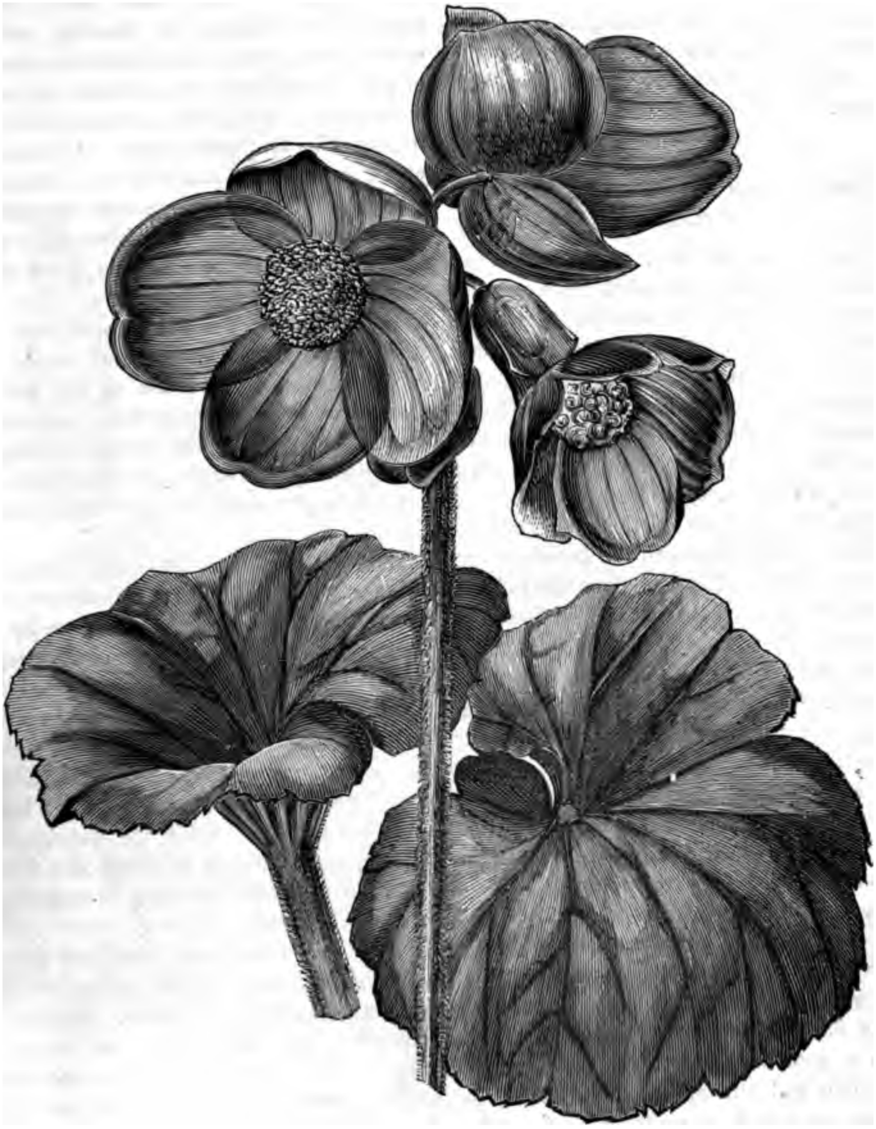
[illegible] tion [illegible] Instead [illegible] a fast grower it is one keeping within limited compass, and will have many admirers on that account. Its density of habit is very marked, the leaves crowding together up the stem, and depending, or rather arching nicely away from their respective bases. The hue is of a dark bronzy brown, much darker in tint than D. ferrea, or any others of that colour. The attraction is heightened by the metallic lustre that pervades the surface, shewing to much advantage against light and shade. It has had the highest commendations in the power of Royal Horticultural and Botanic Societies to give. It, too, is one of the South Sea Islands plants, introduced by J. G. Veitch, and sent out for the first time last season.

BEGONIA ROSÆFLORA.

Among beautiful-leaved plants Begonias have produced numerous varieties that captivated the public very much *pro tempore*. Like everything that becomes plentiful without difficulty, a distaste arose, and hence w[illegible] now so few of these beautiful leaved begonias. Anybody saving a few seeds, and sowing them in heat, a progeny arose of colours as diverse as the famous "coat" of old, and the same attention, as regards cul

Dracæna Macleayi.

tion, was not given as to other plants re-ring a little more skill. We regret this in interests of villa gardeners, for such things can be had cheap and effective are what a at many are now-a-days aspiring to. We ok, therefore, for a return to old loves be-re many months elapse.



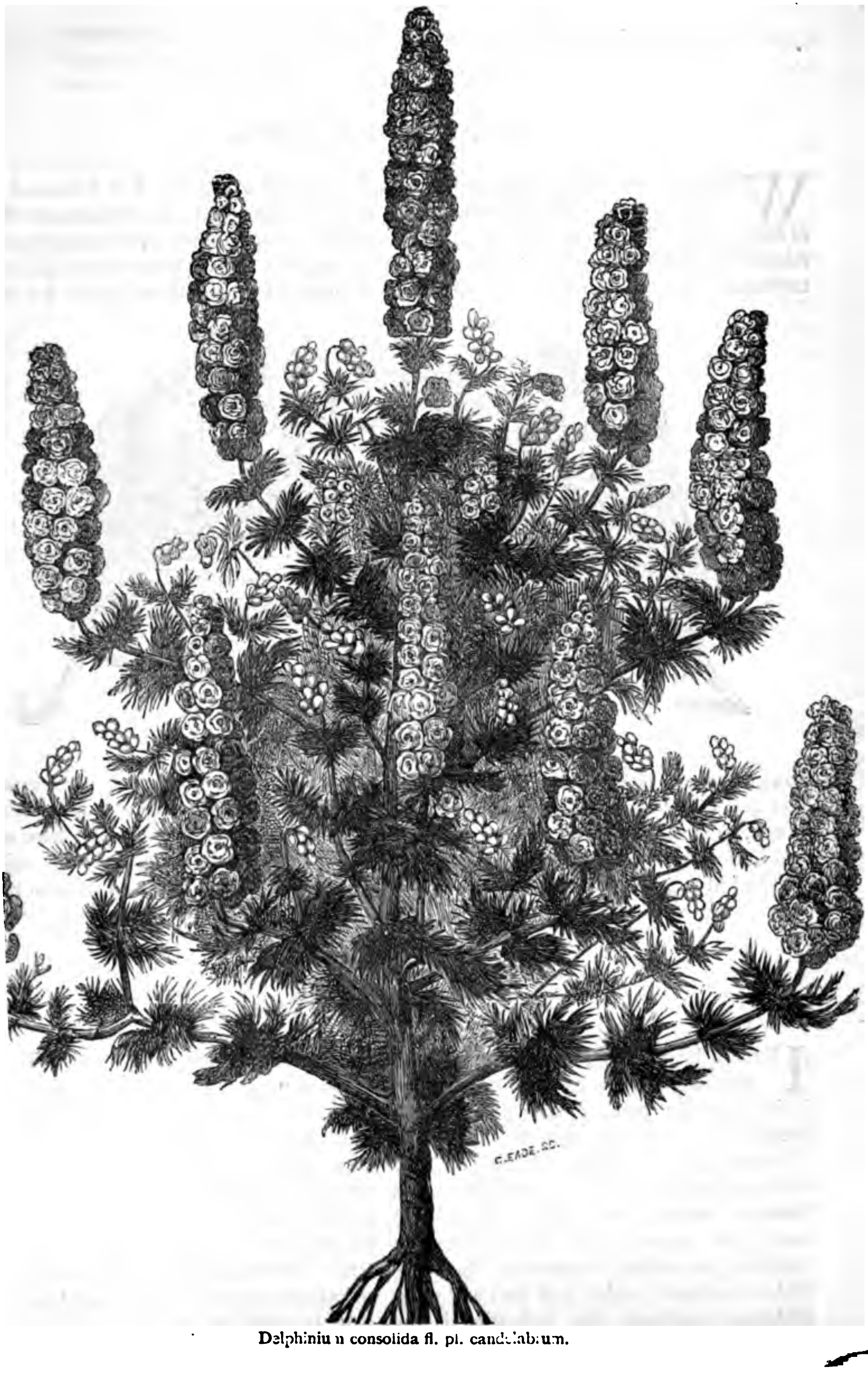
Begonia rosæflora.

The subject of our engraving is *not* one of ose we have been descanting upon, but it a floriferous one of a more hardy nature. It was found on the Andes of Peru, at an elevation of 12,000 feet, and is therefore purely a greenhouse or hardy begonia. Mr Pearce (at the time one of the Messrs Veitch's collectors), discovered it, and sent it home as a plant likely to gain popular favour. In this he has not over-estimated the result. Its fine uniform leaves standing flat, and not rising many inches from the crown, render it conspicuous, and fit it well for associating during the flowering period with such things as gloxinias. The flowers come in threes, and occasionally in fives, from a hairy foot-stalk, and are of a pleasing bright rose colour. The segments are of fine full form, and are relieved by the centre mass of combined staminode matter, as indicated in the engraving. Any one with a greenhouse can cultivate the plant, and be rewarded with plenteous blossoms.

DELPHINIUM CONSOLIDA FL. PL. CANDELABRUM.

No one who has seen a collection of branching larkspurs but must have a lively recollection of their ornamental character. All larkspurs are very pretty garden plants, from the profusion of the flowers arranged hyacinth-like on the spikes; but the branching forms represent little specimen plants, and on that account are more sought after than the ordinary type. The life of the one is longer than the life of the other, corresponding in this degree with the Intermediate against the Ten-week stocks. In order to have full value for labour and first cost, it is well to be early with the sowing of the seed. If springtime be decided upon, as is usual with most of the annual seeds, it must be early spring, and a good position ought to be selected for the growth of the plants. No worn-out, ill-manured soil need be tried to reproduce samples such as our engraving represents. To produce first-rate flowers, it is quite as necessary to draw from the manure heap in plenty, as it is to secure a good crop of cauliflower or cabbage. Our readers who have any experience in that matter will comprehend what is competent to secure that. With a full complement of the solid stimulant in a good soil, and the position, as respects light [illegible] atmosphere, not blinded by [illegible] shu [illegible] the sunlight, or treated to volumes of smoke and discharge of smut, success may be counted upon. The better the locality, the better the plants will grow and flower. July and August are the months in which the branching larkspurs usually shew their inflorescence. The milder the locality, and the opener, freer, more disintegrated the particles of soil, dressed with the addition we have recommended, so much the more hospitable will the home be for the larkspurs. Not that they won't grow but in soil and in a situation of that description, but the nearer our villa gardener can supply the requisites the less disappointed will he be. It is a good plan to sow a parcel of seeds in autumn. The plants, if they tide over the winter, will come away strong, and flower earlier and better, than spring-sown plants. None of the larkspurs care about being transplanted. Any one can prove that by trying the plan of thinning and transplanting afterwards. Our advice is, then, sow where you mean the plants to grow and flower.

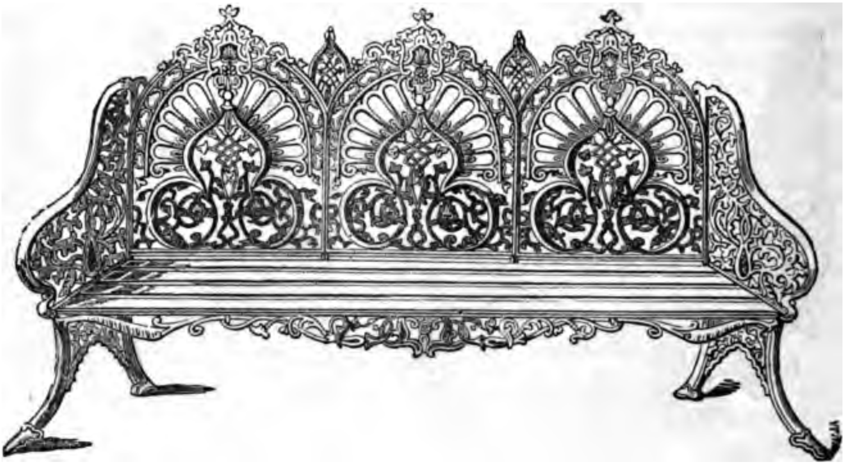
But the ordinary branching larkspur is quite eclipsed by the candelabra-like novelty ushered into notice and commerce by Dick Radclyffe & Co., of which we give an engraving on opposite page. The usual type is taller and less compact generally than the subject of our notice. Not that many of them do not flower so profusely, for we have had them ourselves quite as numerous in the branchlets; but then the habit, the density of the spikes, and the fine hyacinth-like form of each shoot, invest this what is called Stock-flowered larkspur, with great effect. What is an additional recommendation, and will multiply the number of buyers, is, that it it is to be had in a variety of colours, blackish blue, violet rose, light blue, tricolor, and white. The plant is well clothed with leaves, and remains quite as long in bloom as the best of the branching larkspurs already in commerce.



Delphinium consolida fl. pl. candelabrum.

IRON GARDEN SEATS.

WE present one of the handsomest patterns of Garden Chairs to the notice of our readers. Such a chair would be in admirable keeping for balconies, terraces, promenades, lawns, and certain spots in choice flower gardens. It is one of those patterns that take the eye of even the most fastidious in matters of taste; the design being pleasing, and the form of both the seat and the back of that mould to give comfort and elicit satisfaction from all loungers. The Fern and Blackberry designs, and the Midsummer Night's Dream, as well as the Convolvulus pattern, are all elegant; and we may have an opportunity in future of placing them before our readers. Of course they are all much more expensive than the common Leicester Garden Seat, but the appearance is so much the more stylish, and many of our readers may not object to cost, provided they get good value in return.

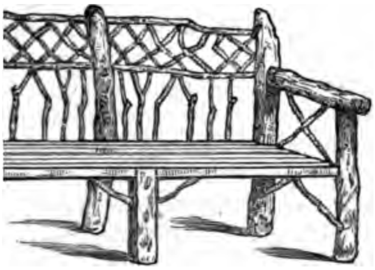


Ornamental Cast-Iron Garden Seat.

RUSTIC GARDEN SEATS.

I[illegible] there be one thing more comfortable or [illegible] sing about [illegible] garden than another, [illegible] During the summer [illegible] the chief places [illegible] ing the [illegible] ming that [illegible] ome [illegible] are cherished [illegible] making the round of the vegetable department, where both fruit and vegetables are combined—the inclination is decidedly towards comparative rest. The house is too monotonous to seek repose in; the idea is to have some contemplation of the outward world, where nature presents itself in such variety as to give a reflective mind chance for ample communings, which are often delightfully seasoned with the song of an innumerable company of feathered choristers. Where can these communings—these reflections on the passing beauty of the hour—be so comfortably enjoyed as lounging in upon a chair, which may be placed drapery of some depending, if not form cf tree, in a corner of the

seat, for instance, as this, can be got up by the accumulation of a

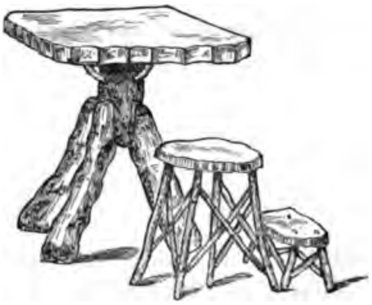


Rustic Garden Seat.

branches, that our rural villa gar- n so easily secure. Rustic seats, of , are most compatible with seclusion, ys become a position underneath of trees of all kinds. In this respect ims are paramount. Any form of is suitable on a lawn in connexion uet-ground, bowling-green, or precise al design. Any form of the same is suited for seclusion, where nature is iated from. The chair engraved, not remarkable for the grace of its s purely a chair for such positions, are many of them throughout the

ble given is not quite so common, but its uses and advantages are quite obvious For any lady or gentleman jotting down notes in connexion with the routine of operations in a garden, the entry of any particular plant flowering; the noting down of when the table has been supplied with vegetables, or the ripening period of the various fruits, or the taking down of any notes which the memory dare not trust itself with, are all topics of no mean importance, and add to the utility as well as to the furnishing of the garden proper.

But that paterfamilias may be fully provided for a growing household, we give engravings below of a gradation of sizes of stools, which have a certain style of beauty, if not of elegance, about them, and come in well for accommodating the "olive branches" of the family. All these things have the merit of simplicity about them, and any handy operative gardener, or even a "natty" labouring man, could get them up at no very great expense.



Rustic Table and Stools.

COVERED GARDEN SEATS.

subject appears to be a very attrac- ve one for our fair readers, if we ge from the large correspondence ailed upon us; and in compliance erous requests, we shall illustrate in s all the numerous contrivances for shelter now before the public.

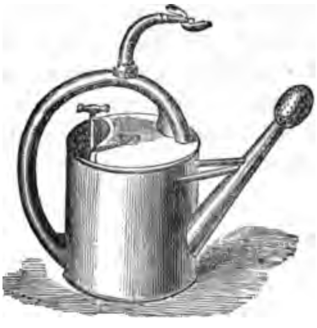
DERBY GARDEN SEAT AND SHADE

rvedly obtained a large share of popularity, more particularly since the make adapted the awning, which is easily spread down, or rolled up at pleasure. Were we to suggest any improvement upon this, it would be that of having a slight waterproof covering for the rolled-up awning, stretched along the top, between the two upright supports. In this, as well as all other out-door seats, we denounce the use of green paint, that being a colour which can neither appear in proper unison with, nor in contrast to, the greenness of the surrounding grass and foliage. Varnishing is preferable to painting, as sh the natural veining and markings o timber; next to it, painting and graini imitation of timber; and, lastly, plain ing of any light wood colour is admi The iron framing of seats, when ca formed in strict imitation of either rus wrought timber, may be timber-paint either of the above modes; but where is reduced to iron-like dimensions, t distinct iron, bronze, or other metallic c ing should be adopted, for nothing is incongruous, although frequently exem than timber-painted iron supports, were they actually timber, seem sc capable of supporting the seat, and certainly succumb under the accum weight of seat and sitters.

Derby Garden Seat and Shade.

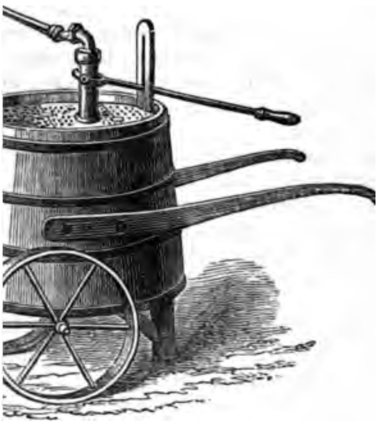
GEM CONSERVATORY ENGINE AND WATER-POT COMBI

THIS is a novelty, introduced by Messrs Elliot & Co., of Manchester, combining the two important processes of watering and s[illegible]ging [illegible]ch are needed every da[illegible] [illegible] th[illegible] [illegible]nse[illegible]ry less or more durin[illegible] [illegible] [illegible] furnish th ordinary moisture supply of plants; the to keep the surface of the leaves uncl with dirt and filth, so that the action atmosphere may be unimpeded. Tl graving represents the syringe fitted ordinary mouth of the water-pot, wi distributor attached to the highest p the improved handle. The rose dist is differently constructed from the or flat and convex roses, and is perfora such a way as water can be sent spr over a large surface. The improved of this, as well as of some others we already recommended, is an improv the hand moving downwards as the p process of emptying. It is a very useful pot and engine combined for any garde for villa gardens particularly.


gine and Watering-Pot.

GARDEN ENGINES.

RE is great variety in garden engines, and all are useful—some more



Garden Engine.

an others. The above is a sample of powerful one, suitable for syringing wall trees, and trees and shrubs of all kinds. It also does duty well in the hothouse and greenhouse, or wherever cleaning by syringing is needed. In gardens of any extent a powerful engine keeps down insects, and keeps up the healthy tone which all trees, shrubs, and plants ought to possess, if they are to be looked upon and admired as they ought to be. Inattention to a day or two's washing of fruit trees, for example in spring, will often be attended with unfruitful results. Caterpillars, mildew, and other pests, make insidious raids, and live sumptuously upon vegetable diet. Water is the great cleanser, and the syringe is the proper instrument through which it tells with effect.

It is unnecessary to explain the details of the engine and carriage engraved, as they must be patent to every one.

PRUNING KNIFE.

pruning-knife we recommend for neral purposes, is not a clumsy thing. enerally useful knife for any lady or n to carry about, in contemplating in garden operations. This form is , owing to the "set" in the handle, e operator more power, and fitting much better than a straight-handled y the end being shod with iron, it to do duty well as a small hammer. s cannot always be carried about upon the person, but this knife can; and there are so many nails needing driving about flower-shades and small boxes, and many little things, that the buyer should think of, and provide for. It is very little more expensive than one unshod, and the blades are generally of better material.

Pruning Knife.

Work in the Garden during August.

From "THE VILLA GARDENER."

SEPTEMBER! We hear the rustle of the wheat falling before the reaper's scythe as we write. We have reached the zenith of the season, and are passing down towards the horizon. Is it because of this change in our standpoint that autumn beauty seemeth to exceed all others? The Rev. Reynolds Hole says of our second harvest of roses:—"It is but the glancing of the grapes, the echo of the chorus, the after-glow of the sun; but our happiness among the autumnal roses is, I think, more intense than ever. We can appreciate them more calmly than when our eyes were dazzled by their overpowering splendour, our attention distracted by their infinite number. And we cling to them more fondly, so soon to leave us." The whole of this beautiful extract is not applicable to our gardens. For our flower garden, for instance, is now beautiful—running over with beauty. We have had no floral harvest to equal the one now gleaming and sparkling in the sunshine. But yet there are not wanting symbols of the "so soon to leave us" in ripening fruits and swelling seeds. And this thought, no doubt, endears the charms we have in autumn. The bare risk of losing enhances the value of possession. And yet, apart from the fact that we see "passing away" written upon all autumnal glory, early autumn seems to have a beauty of its own, exceeding that of any other season.

"No spring nor summer beauty has such grace,
As I have seen in an autumnal face."

This was the language of a fond husband to an exemplary wife when past the meridian of her days. It is as true of the face of nature as of woman. The season is not only a granary of plenty, but a picture gallery of beauty. The golden grain bending its head to the earth beneath the burden of our food; the trees and bushes laden with fruits of all shapes, sizes, and colours; the forests are flushed with royal splendour; the skies dipped as it were in glory, forming an enwrapping mantle of many-coloured beauty—all things enrich and adorn autumn-tide. Even the sun and moon [illegible] the earth at reaping time. [illegible] their brightest, [illegible] that lines [illegible], blocks of co[illegible] [illegible]ary heads of long grain [illegible] with gorgeous coverlets of leaves [illegible] flowers [illegible] artistically blended and merged into each other, as the sky sinks into the [illegible]

This is the month to enjoy the flower garden. Without blanks and without fault ought to be its character. Winter and spring increase, and summer culture, all culminate in an autumn picture of superlative beauty.

Last month we remarked that the die (strangely enough misprinted "decay") of the year was cast. It is; and true is the pattern struck out for us. Very beautiful, is it not? Let us thankfully receive and gratefully enjoy it. The pleasures of gardening are always increased—heightened by diffusion. To reap more pleasure from your garden, you have only to scatter its produce more widely among friends and neighbours, and let more eyes be brightened, more hearts gladdened by its beauty. The pleasures of gardening are like the widow's barrel of meal and cruse of oil. Shared, they are inexhaustible; selfishly confined, they shrink to the dimensions of one miserable meal. In gardening pursuits—

"Let each for the good of the whole be lent,
And store up his treasure for all;
And hope for an evening of heart-content
For the winter of life, without lament
That the summer is gone, with its hours mis-spent,
And the harvest is past recall."

This must not be our lament; and it will not be if each thus tries to promote by his garden the happiness of all. We have seen gardens become curses to families through the thoughtlessness of those who own them. Children locked out; brothers and sisters afraid to touch or smell or cut a flower. We don't want to encourage such selfish editions of villa gardening. Let the garden be the sunniest, happiest, holiest spot to the whole household, and with that idea let us go forth to do the garden work of September.

THE KITCHEN GARDEN.

Autumnal kitchen gardening is sometimes rather up-hill work. What with dry weather and pests of various kinds, crisp sweet vegetables are neither so plentiful nor juicy and sweet as they are earlier or later in the season. With the autumn tints on the trees, stickiness and hardness are apt to be manifested among vegetables. Cauliflower or cabbage becomes a prey to greedy caterpillars. Peas are stopped in their growth, and hindered from continuous podding, by the all-embracing hug of mildew. Lettuces bolt into seed, and French beans link themselves with

ns. Even turnips taste strong, and carrots
ransition state of insipidity between youth
This month is not an easy one for the kit-
ener. There is not much sowing nor plant-
great deal of nurturing, needed. Constant
be maintained against all butterflies of
, if cauliflower or any kind of greens are to
d without the accompaniment of caterpillar
o great is the horror of many having the latter
forswear all such green luxuries for this
By catching all butterflies as they appear, the
terpillars enfolded in the sweet crisp meshes
wer or cabbage leaves will be impossible.
vever, any straggler should escape, all such
oughout the entire month should be steeped
ours before cooking in a weak solution of
water; that is, half-a-handful of salt in a
water. It is important that the amount of
d not be exceeded: if the vegetables are
a stronger infusion the vermin are killed at
the object of the steeping, to bring them
e, is defeated. I am thus particular about
r, as few things create a greater distaste for
than a dead caterpillar or snail found at
ish all the readers of THE VILLA GARDENER
good vegetables all the year round. I not
hem how to grow them, but occasionally how
d eat them; a negative means of doing so
as few caterpillars and slugs as possible in
n, and none in the pot. Next to butterflies,
mildew will be the greatest pest; it often
eas with fatal virulence during this month.
preventives are a deep rich soil, and abun-
rings at the root and overhead; for once
w originates in an excess of water, it springs
ty times at the bidding of dryness; a dry
y air, and a dry top cause mildew. Pre-
th copious waterings. If, however, it does
tack it instantly with soot, sulphur, and lime,
gly or combined in equal proportions. The
for applying it is the early morning, when
and stem is covered with dew; the best form
y fine dust; and the best mode with a coarse
ending the dust, as much as possible, up and
d sideways, so that none of the mildew
e covering of soot, sulphur, &c. One dose
ently arrest the plague of mildew; but when
a firm footing, a second, or even a third, at
of two or three days between them, may be
Generally two will suffice, after which the
mixture should be dashed off with heavy
watering from coarse-rosed watering pot,
d off with the garden-engine or hand

e localities, however, the mildew remains
the peas, and finally stops. But as a rule
re remedies, especially if associated with the
cal preventive ones of deep culture, rich
opious waterings, will result in providing the
ry of fine gatherings of green peas.

Potatoes.—Take up at once each sort as it ripens. Proofs of ripening are yellow, flagging tops, and tubers with the skin so firmly set that it cannot be easily rubbed off with the hand. Carefully pick the potatoes up into shallow baskets without bruising them, and lay them up in pits, narrow like the roof of a house, or in a cellar, for use. In either case a little dry earth should be sprinkled among the potatoes, this keeps them sweet and fresh, and gives them the flavour of potatoes newly taken from the ground. As much care should be taken not to bruise potatoes as not to bruise apples. They don't shew it so soon, but every blow will become a black patch or a mass of rottenness by-and-by. Potatoes intended for seed should be placed in a shady situation out of doors for a month or six weeks, to be turned over every week until they become almost as green as grass. They must then be stored away in the usual manner in pits, or, better still, laid out singly in garret or cellar, away from the reach of the frost until planting time. The results of greening will then be found in shoots like miniature oaks rather than common potatoes; and this extra strength will be seen in the vigour of the plant, and size of the tubers. Dig up potato ground at once, and instantly plant it with Walcheren brocoli or cabbage, or sow it with turnips, winter onions, or spinach.

Onions.—Carefully store these as soon as they are ripe; go over the ground some weeks previously and bend down all the thick stiff-necked ones, and in storing keep these by themselves for immediate use; and, as a rule, the smaller and shorter the neck of an onion, and the more even and regular its shape, the longer it will keep. Onions should be carefully dried, in the shade if possible, and then stored in a dry, nearly frost-proof place; the latter, however, is not of so much consequence, as, if thoroughly dry, they will better bear five or six degrees of frost without injury. The two things to be avoided in the keeping of onions are heat and moisture. The Tripoli onion may still be sown on a rich firm piece of ground, to stand the winter, and the two-bladed, or Welsh, may also be sown on a bed to draw for winter eating, by those who like green onions as an antidote to winter's cold.

Lettuces.—Sow in the beginning and end of the month the best sort of cos, such as the hardy brown, and the best sort of cabbage lettuce, such as Lee's Hardy Hammersmith (improved), on rather poor ground, in sheltered places, to stand in the seed beds throughout the winter, or for winter growth in Rendle's Protectors, and for planting out in the open ground during the spring. Plant out by the side of south walls, and under the protectors, the strongest and best plants from those sown last month for winter and spring use.

Endive.—Plant out in similar places at the same time, and make a final sowing of the Green Curled. This often passes through the winter better than the lettuces, and proves a welcome addition to the salad bowl at all seasons. Blanch—that is, make white, crisp, and tender advancing crops, by tying the plants tightly together, only laying a tile or slate upon the plants, or turning a pan or flower pot over them. Endive is not fit to eat unless it is then made white. In a green state, however tender, it is too bitter for English, Scotch, or Irish palates.

Celery.—Water copiously in dry weather. Remove suckers; loosely tie the plants together with wide strands of bast or matting, and earth up a batch every month sufficient to keep up the supply. See previous instructions.

Cauliflower.—A little more seed may be sown beside the winter lettuce. If the plants get through the winter they will prove most useful next spring. The strongest plants from those sown last month should be pricked out under south walls, &c., with the chance of passing through the winter. Towards the end of the month, the medium sized plants should be planted out under handlights or Rendle's Protectors, and in frames, to receive the shelter of glass during winter and early spring. Three times the quantity meant to flower should always be provided for. The extra plants to be put out at the end of March, to make a succession to those that have had the protection of glass, and also to provide against failures. Growing crops of cauliflowers will now need the assistance of manure water to stimulate rapid growth, and ensure ripeness and sweetness.

Cabbages.—Another bed might still be sown beside the winter lettuce, and those sown last month pricked out into nurturing beds. Towards the end of the month a sufficient breadth of onion ground, potatoes, peas, early turnips, or carrot ground, will almost certainly become vacant to permit of the main crop of spring cabbages being planted out in rows 18 inches apart, by 1 foot or 15 inches asunder. The ground should be heavily manured, deeply dug, and if light rolled down, tolerably firm before planting. After making the roots tight, the surface between the rows could be slightly stirred with a hoe. Good plants from the nursery beds thus planted, will go away at once and get well established before the winter.

As *Late Peas, Scarlet Runners, and Kidney Beans* are almost as much prized as early ones, I must again advert, not only to the importance of good cultivation, liberal manuring, and plenteous waterings, but likewise to clean gathering. One pod left to form ripe seed will exhaust the plant probably more than 20 pods of either of these crops gathered young. If, therefore, you want these sweet vegetables late in the season, your motto must be, no seed ripened in the autumn. In small gardens it is never desirable to save seed at all unless of pet varieties, and this should be done early in the season, when the sacrifice of edible produce involved would not be felt.

The long dreary nights of September are favourable to the growth of other things besides partridges and turnips. Among these, weeds prove very troublesome. We must attack them with hoes and hands until they are utterly routed.

Brocoli Tomatoes, Ridge Cucumbers, Vegetable Marrows, Cauliflowers, Lettuces, &c., will also need encouragement by scarifying the surface and earthing up, &c. A good many dead and dying crops will require removal. Gravel walks are apt to become mossy and green. Attention to these matters will fill the hands of the vegetable grower for the month. While busy with the present, he must provide for winter, without, if possible, permitting one sign of its advent as marked by death or decay, to shew itself in the garden.

THE FRUIT GARDEN.

Though this month may be described as a somewhat heavy one in the vegetable department, the labour is a light and delightful one among the fruit. The work in this department in September is chiefly of the most ordinary character; the trees have been moulded into form, their growths either removed or utilized, and placed in their proper positions, and we simply wait in a state of expectancy for the harvest. Such a state, however, is not wholly free from anxiety, it mostly means a condition of watchfulness, and we have still to watch the trees and keep an eye to their produce, if the first are to be all we wish them to be, and the second to find its way to our tables. A few stray or strong shoots of peaches, apricots, nectarines, or plums may still need nailing or tying in, to prevent the wind snapping off what we had provided to fill up a blank space on wall or espalier. The ties or shreds on vigorous shoots should likewise be examined: many of these will be found pinching the fast-swelling young wood, which should be instantly removed, or they will become fruitful causes of canker and other diseases. Large leaves, again, will often be found flapping over the face of, and overlapping the finest fruit: their shadow prevents the sun from colouring it or developing the highest quality. As they have now nearly completed their work, they may be thinned or entirely removed, with great advantage to the fruit and little or no injury to the trees.

It may still be well to water peaches and nectarines or late plums freely in dry weather, and the size of such fruit is wonderfully developed by a heavy sprinkling overhead in the evening of hot days. This daily washing also tends to keep the trees clear alike of red spider and mildew. As soon as the fruit begins to ripen overhead the sprinklings must cease. Apricots are hardly subject to the attacks of any insects, and these washings are not needed for them—they will also have been gathered in most places last month or early in September; but unless the fruit, in many places, are carefully watched there will be little left to gather. It is a singular thing that birds are not nearly so troublesome to our superior as to our inferior fruits, while they will fearlessly seek death itself in a net rather than not dine off our currants, gooseberries, cherries, raspberries, and strawberries. They seldom do much injury to peaches, apricots, or nectarines. Plums are a sort of intermediate fruit and are treated accordingly by the birds. They have often attacked these most edly, and the fruits I have named. But if spect our wall-fruit, smaller vermin do not, wasps, bluebottles, ladybirds, and ants attack it were wholly their own ; and the battle these innumerable hosts and the fruit-grower the fiercest even to death ; it ceaseth not by night till the pests perish or the fruit is all d. Ants must be treated to a boiling hot their nests, and dosed to death near the trees empting bait of treacle and arsenic ; earwigs, into dry bean-stalks placed between the s and the wall, and blown out every morning an of scalding water ; wasps and flies enticed tles of sweet mixtures of beer and sugar, whence urn no more ; wasps' and hornets' nests must ht for, and every one of them suffocated with r chemicals, or smeared up in their homes with netrable barrier of liquid coal tar. All these ive recipes may be condemned as heartlessly I cannot help it, the choice offered us is to spare ests and lose your fruit, or save your fruit by ng the pests. Compromises are of no use with nin ; it is a war of extermination upon the fruits insects, and we are thus compelled to fight the bitter end. If any one of our readers, r, can inform us how to destroy them swifter, s pain to them, and less trouble to us, I shall emely grateful ; the whole business of destruc- ateful to me, but it must be done. It is of e telling our readers how to grow fruit unless inform them how to save it after it is grown eedy locust-like hosts of ants, wasps, earwigs, ebottles ; we can neither net these out nor warn f, and we must either destroy them or lose our Those who have none to lose can afford to be ntal ; we who have much cannot. Our business row fruit and to deliver it over to the rightful not to a parcel of thieving vermin, who have noved foot, wing, nor tail to make it grow ; ll fruit before it is fully ripe, and lay it in a it-room a day or two before it is eaten. Late uch as the Imperatrice plum and Morello , and currants intended for winter dessert, must ected with thin canvas or closely-meshed fly- ets. These should be kept well off the fruit, or nd hornets will nibble holes through the barrier troy the fruit inside. It is a good plan to mat w currant bushes with thick garden mats, the &c., will seldom attempt to pass such barriers do not relish going into the darkness ; earwigs ts, however, are not to be thus baulked, and ast unseen, to the utter destruction of currants cted.

rels and rats will also be having a sharp tooth rts and nuts. These will be fit to gather by of the month. Grapes on walls will generally be put into muslin bags as they begin to The same practice will have to be adopted gs where wasps and flies are plentiful. The re unusually numerous this year. All useless or late growths on vines should now be stopped, and the entire strength of the plant be thrown into the ripening of the fruit and wood. Autumn-bearing raspberries should be tied up, and the plants matured in dry situations. Few fruits are more useful for dessert, or more refreshing than raspberries at this or indeed any season. The summer-bearing sorts may now be stopped or finally thinned out to about 4 canes to a stool, liberally manured and dug between.

Strawberries.—Top-dress the old plants with a rich coating of manure 6 inches thick, if you can afford it, either left on the surface or slightly forked in, bringing up about 1 inch of soil to the top. On no account must the plants be dug between the rows or the leaves cut off. This is also a good time to make new plantations with well-rooted runners, layered at the earliest moment, either in pots or on the ground. Trench every vacant space of ground, from 2 to 3 feet deep, incorporating plenty of rich manure with the soil, and plant the rooted runners in rows of 2 feet apart, and 16 or 18 inches from plant to plant. Strong plants got in now will yield half or three quarters of a crop next year, and a tremendous crop the year after. If old forced plants could be got for the planting, as recommended last month, a full crop would be gathered next season. Where the forced plants of this spring are still fruiting in the open air, the plants must be well watered, and the fruit protected from birds.

Though it has taken a good many words to simplify and explain the work in the fruit garden, it is almost all epitomized in the simple orders to protect and gather ripe fruit.

THE FLOWER GARDEN.

This is one of the most enjoyable months in the whole year where what is called the budding system is carried out. The long cool nights mostly bring out the colour of leaf and flower in the highest perfection, and make the beds and borders look their brightest and best. As a rule, from this time all stimulation of growth must cease, unless in the case of Verbenas, Calceolarias, and such plants as may have exhausted themselves by excessive flowering. Every dead flower must be picked off Pelargoniums, and indeed all other plants, as soon as they fade, and more blossoms urged forward by liberal waterings with sewage. Verbenas and Calceolarias are apt to prove intermittent bloomers on account of their profusion of flowers. Continuous flowering can only be sustained by not allowing any seed to swell, and feeding the roots well. Ageratums, Salvias, Petunias, and Pelargoniums, and indeed all budding plants, should be deprived of their seed at once. This not only improves their appearance, but husbands their strength and ensures a continuous display of beauty. This is a good month to note the effects of and various arrangements as regards colour, light, and general results, and to plan next year's arrangements by an embodiment of all the merits, and a weeding out all the faults of this. An hour, note-book in hand, in the garden now, will be of more use than days spent over the principles illustrated by practical examples, real or imaginary, of grouping in winter. Seeing is a wonderful aid to successful blending, contrasting, or harmonizing of colour.

Many of the strongest growing plants will need trimming in and keeping within bounds at this season. To maintain the balance of size, the strong must be curtailed, the weak encouraged. This regulation must be done with care and judgment. No reckless slashings must be indulged in, either to keep the plants to their proper size in their right place, or to furnish cuttings. With proper judgment the two things will proceed together without leaving scarcely a knife-print on the beds or borders. Of course all trimmings at this season are converted into euttings on the instant, until a sufficient stock is provided for next winter. All flower garden plants may be propagated now, with the exception of Calceolarias, which are better deferred till next month. Early cuttings are the secret of safe wintering, and of strong plants next spring. Again, the cuttings of most things should be small as well as early. No central or main shoots of such plants as Verbenas, Petunias, Ageratums, and Calceolarias should ever be converted into a cutting, but the side shoots only, that break singly, or in pairs, from any bud on the main shoot. For the reasons on which this advice rests, as well as full instructions for the propagation of cuttings of flower garden plants, we must refer to other papers in this Number.

Roses.—Look to the tying in of growing shoots that are heavily laden with buds, and secure them at once. Strong autumnal growths are apt to be made rapidly, and are consequently tender and easily snapped off. Few things are more trying than to lose an autumn harvest of roses for want of timely attention. Fresh budded shoots are often wrenched clean out of the stock by the passing sweep of the wind. Remove all suckers and weeds, and give yourselves up to the pleasure of enjoying your second harvest of perpetual roses. The flowers will not be so numerous nor so flaringly bright perhaps, but the colours may prove more clear and delicate; and it may be the romance or the creeping shade of winter, but they also seem sweeter than ever. Like the sun himself who reserves his most glorious beams to the moment when he leaves us in darkness, so autumnal roses often clothe themselves in more than summer beauty, and distil an excess of sweetness before winter enwraps them in his icy olds. Early budded roses should be gone over and ntied, and more loosely re-tied to give the swelling hoots room. Those growing freely may have the wild shoots cut back to within 10 or 12 leaves of the nserted bud. But on no account must the wild hoots be stopped back before the rose bud is dormant. It is a misfortune to do anything to cause hese to break after this time of the year. Such late growths can only result in weakness next season, if hey do not expose the plant to certain death during winte The grandest roses are cut from maiden shoots, that is, buds inserted one season lying dormant in the stock all winter, and that start into growth next spring, and give up their wondrous harvest of beauty and sweetness next June. Cuttings of roses inserted last month will now be rooting, and should be gradually hardened off by freely exposing them to the open air. Cuttings of perpetuals and climbing roses may still be inserted in cold pots or under protectors to receive the shelter of glass during winter. Any late briers may yet be budded if the bark of stock and bud will separate freely. Rose shoots infected with mildew should be dredged over with dry soot or sulphur when the leaves are wet. Such dustings to be washed off in about a week. But the antidote to mildew is copious watering in dry weather. Unless the roots are too dry, it is seldom that mildew attacks the tops of roses.

Dahlias.—If perfection be aimed at in the culture of this grand autumnal flower, they will now require great attention. The shoots must be thinned, the flowers reduced in number, the branches securely tied to strong stakes, and the roots nourished with manure water twice a-week. Insects, especially earwigs, are the great enemies of the dahlia, must be trapped in small flower pots baited with a bit of cold potato, and the additional allurement to "rest and be thankful" in a warm bed of dry moss or soft hay. These must be examined daily, and the unsuspecting insects destroyed. Where purity of colour is an object, the dahlia blossoms must be shaded from the midday sun's broad glare by the use of pasteboard caps.

Hollyhocks.—The cultural treatment may be the same as dahlias. These are magnificent plants for filling the eye, in backgrounds of flower gardens and the foregrounds of shrubberies. They also form fine avenues in small gardens, and well done in fine vareieties, are magnificent plants anywhere if not brought too close to us. Save seed of the best varieties and sow it at once. Also look out for cuttings at the base or along the surface of the flowering stems, and put in forthwith in a cold frame.

Carnations, Cloves, Picotees, Pinks.—Prepare nice light ground by liberal manuring and deep digging for planting out rooted layers, pipings, &c. Place the plants 1 foot or 15 inches asunder and get them well established before winter. The choicer varieties of picotees and carnations are generally potted in pairs in 5-inch pots, in which they are wintered under glass.

Pansies.—Plant out cuttings in beds, weed out worthless seedlings, turn in old plants, and top-dress them.

Auriculas and choice *Polyanthuses* in pots may yet be shifted and cleaned.

Plants of *Phloxes*, double *Rockets*, *Pentstemons*, and other *Perennials*, may be divided as soon as they are out of blossom to increase the stock for another season.

China and German *Asters*, French and African *vlds*, double and single *Zinnias* and *Stocks*, may re their individual flowers enlarged in size by mely thinning of blossom buds, thinning of , and watering of the roots with rich manure . All such plants will need careful staking in me, to prevent the weight of the flowers or the of the wind breaking or disfiguring the plants. nly by anticipating the wants of every plant and ; to each the attention it needs before it needs it, y the most scrupulous attention to the mowing ss, the sweeping and rolling of gravel, &c., that ns are made to assume that cared-for appearwhich is one of their chief charms.

PITS AND FRAMES.

cure a stock of *Hyacinths*, *Tulips*, *Narcissus*, *ses*, *Snowdrops*, and other bulbs, and put them in light rich soil, in 4 to 6 inch pots, furnished 1½ inch of hard drainage, and the same depth ten dung on the top of the crocks, as the drainage led; then plunge the pots in earth, old tan, or -ashes, either on the floor of a pit or frame, or doors. Sow a few more pots of mignonette and out that sown last month. Pot up violets, , Dianthuses, &c., for winter flowering. Give air and water to Pelargoniums potted last month epare them for removal to the open air or the house. Cut down later flowering plants, put in gs, and pot off those already rooted; also shift arger pots or pot rooted cuttings of Fuchsias, ias, &c. Remove balsams and cockscombs from place to the glass house as soon as they get into , and shift into larger pots, seedling plants of arias, Calceolarias, and Chinese Primroses double ngle. Give them plenty of water and abundance and keep the plants close to the glass, to conte their growing strength into blossom rather eaf. Remove Coleuses, Iresines, &c., from these res to the parlour window or glass house.

umbers.—Look over twice a-week, cut the fruit remove every leaf as soon as it begins to decay, and shut up early in the afternoon to sustain a genial atmosphere and stimulate rapid growth.

Melons.—Water with care, put fresh dung, new tan, or short grass round the outside to throw additional heat into the plants, and push forward the swelling and ripening of the fruit. Fruits ripened in pits and frames later than September are apt to be flavourless, therefore remove superfluous leaves and shut up about three o'clock in the afternoon, and cover the glass lights with mats at night to keep up the temperature to 72 or 80 deg.

THE GLASS HOUSE.

Water tender plants, such as Achimenes, Coleus, Begonias, and any other rather tender plants, sparingly, towards the end of this month. At the beginning of October all such plants must make way for Camelias, Azaleas, Cytisuses, Heaths, Fuchsias, Pelargoniums, Chrysanthemums, Salvias, and the usual winter occupants of the glass house. Chysanthemums, indeed, may remain out a little longer, but should be carefully tied and liberally fed. The flower buds might be thinned to one or so, to a shoot, if size of bloom is the only object. But for the furnishing of the glass house or drawing-room, Chrysanthemums are the most effective, grown in bushes, something like Pelargoniums, with a dozen or two branches to a plant, and each branch studded with bloom. True, the blooms will not be so fine, but then there will be many more of them, and the plants will not look like gawky scarecrows crowned with beautiful flowers. In housing plants for the winter see that the pots, the soil, and the plants are scrupulously clean, and mix as many flowers as possible with the green of Camelias, Azaleas, Chrysanthemums, &c., so that we may not anticipate the sombre hue of winter so long in advance. What with zonal and variegated Pelargoniums, late Fuchsias and Chinese primroses bursting into bloom, the glass house towards the end of September should be made as like as possible to a flower garden budding into summer beauty in June.

Arboriculture.

ON THE CULTURE AND USES OF THE COMMON SILVER FIR (PICEA PECTINATA).

BY C. Y. MICHIE, FORESTER, CULLEN HOUSE, CULLEN.

THE common silver fir "Picea pectinata" (Picea of Linnæus, but Abies of some other writers), is one of the most picturesque and ornamental of forest trees, and in some cases the most handsome of the Coniferæ. At times it diverges from the beautiful into the picturesque and even grotesque. With all deference to Gilpen's admitted good taste, he has evidently failed in displaying it here, when he speaks of the silver fir in the following strain: "The silver fir has very little to boast in point of picturesque beauty. It has all the regularity of the spruce, but without its floating foliage. There is a sort of harsh, stiff, unbending formality in the stem, the branches, and in the whole economy of the tree, which makes it disagreeable. We rarely see it, even in the happiest state, assume a picturesque shape. Assisted it may be in its form when broken and shattered; but it will rarely get rid of its formality. In old age, it stands the best chance of attaining beauty."

The silver fir was introduced from Germany or Switzerland, by Sergeant Newdegate, in 1603, who planted some at his residence at Harefield Park, Middlesex, and which, according to Evelyn's account, became very large trees.

It is a tree that attains to an immense size, both in this and other countries, and grows to 150 years of age under favourable circumstances. We are informed by those travellers who have seen it growing in Switzerland, Germany, and France, that it appears to luxuriate under circumstances similar to the larch but prefers a rich dry soil, though at times it is found on ground rather poor, but not gravelly. The silver fir is propagated chiefly from seed, which is ripe in November; but it can also be readily propagated by cuttings and layers. We have alsc seen a considerable number of trees that had been blown down with the wind at different periods, which had struck root in the ground all along that side resting upon it; and this not only with young trees, but with others also exceeding forty years old. The roots also possess considerably more vitality than any others of the coniferous common forest trees, and not only remain longer in a vital state after the tree is cut down, but make an effort to prolong life, as is seen in the exuding resinous matter around the top of the stool, between the bark and sapwood. We never observed any tree actually produce shoots (termed stockshots) in the same manner as hard-wood trees do; but in cases where the tree is cut over at such a height above ground as to leave a few living branches upon the stool, they often produce vertical shoots which would become trees. Another peculiarity of the silver fir must be familiar to most foresters, in its proclivity to produce vertical shoots at any part where an accident or injury has occurred, or when the top or limb is broken off. It is in connexion with this peculiarity of growth that double tops are produced, for it possesses, in common with hard-wood trees, the quality of producing shoots of two distinct kinds, viz., those that grow horizontally and spreading, termed branches, and those that grow upright, and which constitute the stem or trunk. Probably every other tree as well as that of er fir possesses that inherent power of ing both kinds of shoots, and only re- to be placed under peculiar circum- in order to develop them; but the r undoubtedly possesses it in a much degree, and different from all others of iferous class of forest trees, at least nmon Scots pine, Norway spruce, and Though the larch, it must be admit- ssesses it to an appreciable extent. rent, varied, and even conflicting are ounts given of the culture and success ilver fir, that many persons have been l to plant it extensively to the exclu- larch, spruce, and Scots pine; while have been so far influenced on the ide as to have abondoned planting it er, each party believing they have t grounds for acting as they do, and ified in the course they pursue.

out arrogating too much, we shall en- r to shew at least some of the reasons party maintaining their own views ing upon them, and how far each is going to the extreme to which they ther direction.

most every county of Scotland, very ecimens of the silver fir are to be h, growing upon a diversity of soils, riously situated, both in regard to and altitude. We have seen it grow n almost all soils, except gravel. On avel at least Scots pine, birch, and ill grow tolerably well upon, silver fir not to succeed. We have sometimes that we knew cases where this rule lated; but on examining the soil, and lly the sub-soil, we found that, although ace presented gravel, the subsoil was or sandy loam.

counties of Moray and Inverness are ial for their extent of gravelly and oils, and these counties generally are ted for the growth of silver fir. In ration still of this opinion, we met with , of B—— Castle, a few months ago, nobleman, being eminently versed in entered into a conversation about er fir, and his lordship informed us ver fir does not succeed upon his estates in Inverness-shire, but invariably lose their leading shoots at 10 to 20 feet high, and many fail long before that stage of growth. On further inquiry, we found that the soil, where the failures occurred, was of a gravelly and sandy description, which probably accounted for it.

We know of some fine healthy growing silver firs situated upon very cold and wet clay, and upon such soils they are certainly the finest specimens of any forest trees in their locality.

The counties of Dumfries, Peebles, Selkirk, and Roxburgh, comprise soils at once the coldest and most clayey and wet of any in the country; and yet in each of these counties are to be found splendid silver firs. Take for example those trees in Mainswood, near Durrisdeer, Dumfries, some of which contain 200 cubic feet; or those at Cowhill, near Dumfries, of equal size; on the roadside near Annan; and also at Dumcrieff, near Moffat, all of which are noble trees. Or again, look at those splendid specimens at Stobo Castle, and Dauwick House, Peeblesshire, or those at Oldhouse of Killearn, Riddell, and Borthwick Brae, and also at Stobs Castle, Branxholm, Wauchope, and many other places that might be named. We have remarked that soils, however cold or clayey, do not injuriously affect but rather favour its growth; and we would next glance at the altitudes at which it is found to succeed. These as may be conceived cannot definitely be ascertained; but we know of large silver firs growing at altitudes over 1000 feet, and we are informed by others that they know of them of immense size at nearly 1200 feet altitude. Taking therefore the two circumstances together, coldness of soil, and the extreme altitude at which it grows luxuriantly, there can be no doubt as to the hardiness of the tree in relation to those influences.

In regard to situation, it appears very accommodating, and is found growing well in any. But judging from the appearance of old trees, we are inclined to think it will attain the greatest age and largest dimensions in a northern aspect; and in such, the trees appear less disposed to become forked or double topped, but prolong their upward growth with fewer interruptions; hence becoming taller than in southern exposures.

Having stated several advantages and recommendations of the silver fir, we shall state a few objections to it.

After a minute and careful examination of all the various circumstances connected with the culture of the silver fir, we are led to the conclusion that those influences which most injuriously affect it are its liability to spring frosts injuring it, which occur after it has begun to grow, and being then exceedingly tender, it is very apt to be injured by the frost. In addition to frost, there are evidently other influences which injuriously affect the silver fir, it may be exposure to a low temperature, or it may be easterly winds, or other atmospheric influences. This distinctive influence, be it what it may, so far affects the trees of all ages by causing them first to decay on the top and ultimately causing the whole tree to perish, that the magnitude which it has assumed has caused no small alarm and loss to proprietors. This influence, which, in the writer's opinion, is different from frost, whose effects are visible to the eye, is succeeded by the insect popularly known as the mealy bug. And with many it has long been the established opinion that it is the cause, and not the result or consequence of a predisposing cause. It is not, however, essential for our present purpose to know which is the primary and which the secondary cause; but it is, nevertheless, to be deplored that through this influence the culture of silver fir is rendered precarious and uncertain, so much o indeed that many persons have ceased to plant it.

Many silver firs have doubtless been hrown into disease by being planted upon and in a state of cultivation, or in other ords, by being manured. The effects of manure upon certain Coniferæ is so hurtful, and often fatal within a very few years, that most people avoid it entirely; but ground is often planted in which both sufficient manure and lime are present to prove hurtful without a ray of suspicion being awakened respecting them; or of the future failure of the plantation, when it occurs, having even a remote connexion with the lime and manure present in the soil when planted. Why one tree should decay and another close by it survive and flourish is a matter involved in mystery; but if we consider that in a plantation of any description there are trees that come early into leaf, and others that are late, differing as much as twenty days or more between the earliest andthe latest in foliating, we need not be surprised at the different results that take place throughout the whole period of the trees existence. And in the event of frost being the sole influence which affects the silver fir injuriously, it is easily discernible how the results are brought about. If, for example, a frost should occur a few days after the earliest plants have foliated, they would of course fall its victims, and those later of foliating for that season escape. And, on the other hand, should a frost occur twenty days after the first or earliest plants have unfolded their leaflets, the latest ones in leafing would suffer, while the earliest ones, being to some extent hardened in consequence of being so long in leaf, would, in like manner, escape. A repetition of frosts upon a certain plant may so weaken its constitution as to predispose it to disease; hence frost may produce diseases of which it was little suspected.

So much in regard to the culture of silver fir; we shall next state some of the uses to which it is put, and its general and comparative value as a timber tree:—

1st, In the market for railway sleepers there is no difference or distinction made between those of silver fir, Norway spruce, or Scots pine; the general price for either in the Glasgow and Newcastle market is 2s. 6d. each, for what are termed ten inch sleepers, that is sleepers 9 feet long, 10 x 5. They are seldom required to be die square, but must have a face upon the round side 5 inches broad for the chair to rest upon.

When clean grown, it is sawn into staves and heading; but as it is generally knotty, it is not suitable for that or any other when cu

. deals, in consequence of the knots ut, to the detriment of the articles ch it is manufactured.

s cut out of old mature trees make t flooring, especially for bedrooms. rt-wood, and put down dry, nor once to become wet after being laid, the r joints are not liable to open as is e with Scots pine; but the surface rtly very hard where the knots are, ly soft where they are not, causes floors carpets, or where much traversed wear into holes. Boards or scant- lver fir do not warp or twist as larch or ots pine does; hence, on that account serviceable for water spouts, troughs, , and such like. It is an excellent r any purpose connected with sluices, ments, or canals, and is specially l for making coffer dams.

roofing purposes there is no home wood better adapted, being equally for rafters, joists, beams, and lintels; greatest superiority is for soaking, as not warp or twist, or spring the nails at s or edges, which some other descrip- wood does; a circumstance which is rtful to the roof, as it causes the slates to get displaced. No wood is more for partitions, especially to cover with as it is not liable to crack and break s pine does, nor is it so liable to worm is the sap-wood of Scots pine. For stables, breweries, dye-houses, and uildings where the breath of animal m very shortly affects the wood with t, silver fir possesses several pecu- vantages, and lasts twice as long or onger than Scots pine does. It well adapted for fencing purposes, lly for posts, and in wet ground re- ound much longer than the sap-wood s pine. It is not so suitable for rails ally top ones) as for posts, as it is apt k at the knots; but where the wood is f knots, and of moderately slow growth, es excellent rails for all except the top, should be of larch. In manufacturing r, it is advisable, as far as practicable, to t it into scantlings as large as possible, voids breakage at the knots.

From all we have seen of the silver fir, we conclude, that as heavy a crop of it can be grown per acre as of any other description of wood. For example, we to-day examined a group of silver firs and found them growing at an average distance apart of 12 feet, and each tree, on an average, containing 30 cubic feet of timber, thus making the value of the crop at the following rate per acre:—300 trees multiplied by 30 gives 9000 cubic feet, which, at 6d. per foot, is £225. The age of the trees is about eighty years, and they appear to be quite sound and healthy. We know of no trees which, upon the same description of ground, and within the same period of time, would produce so many feet of timber, save perhaps the black Italian poplar, and the Austrian and Corsican firs; but the rapidity of its growth entails a great profusion of branches which, as a consequence, produces coarse and knotty wood. A valuable crop, however, and probably the most so of any would be, say 500 trees per acre, which would necessitate such proximity of the trees to each other as to prevent undue development of branches; hence wood of finer grain and smaller, if not fewer knots. The Norway white wood, which corresponds with our spruce, is, as may be seen in the boards, thickly but irregularly dotted all over with knots; but these being small do not injuriously affect the value or quality of the wood. If, however, they were two or three times larger than they are, the wood would be of proportionately less value.

REMARKS.

1. The silver fir may be planted as a mixture amongst hard-wood trees, or rather in groups, or single trees at wide distances apart amongst them, to form a contrast at once bold and striking amidst the rounded cloudy tops of the hard-woods.

2. It is a tree very productive of branches if allowed room to develop them, and these in turn produce coarse grained and knotty wood. On the other hand, if much confined, it is apt to contract certain diseases on the top, which dies down several feet, and sometimes causes death to ensue.

3. Its tendency and liability is to l w. down with the wind, in consequence of

immense quantity of branches with which it is usually clothed.

4. The great expense of the plants compared with those of Scots pine, larch, or spruce, and tardiness of growth during the first eight or ten years.

5. The comparatively low prices derived for the wood in market compared with many other trees that might grow upon the same soil, and occupy similar space.

6. Its liability to contract diseases, some known, others unknown, but all beyond control, and some fatal.

7. Though personally the writer is a great admirer of the silver fir, yet, for general forest planting, he objects to it on the preceding and following considerations: they are, when planting, if he finds soil adapted to the silver fir, he plants other trees upon it more certain to grow, and likely to pay better when grown.

8. One great objection to the silver fir in the present day is, its great liability to be destroyed by rabbits and hares, which are exceedingly fond of its bark, and prefer it to Scots pine, larch, and spruce. We have seen the silver firs selected and destroyed in the midst of those above named without their being at all injured.

9. Another objection to the silver fir is, its tendency to become forked and divide into several stems, which the wind so acts upon as to break off. These must either be pruned off at considerable expense, or left on to the injury of the tree.

10. The knots of the silver fir are so excessively hard as to injure almost any sort of tools, and carpenters object to it on that account. The woodmen dread it for their axes, the sawyer for his saws, and the carpenter for his planes and other tools.

11. The knots being so excessively hard, and the other part of the wood moderately soft, it on that account wears into holes which, in floors, are highly objectionable.

12. In consideration of all the objections to the silver fir (not ignoring its good qualities), we are personally in favour of planting in its stead Picea Nordmanniana, a tree much resembling the common silver, possessing all its good qualities and avoiding its bad ones, save that its plants are for the present probably six times dearer, but will, it is anticipated, gradually become cheaper.

The Apiarian.

SWARMING OR NON-SWARMING OF BEES.

'HIS question is of great importance, and
will be considered as fully as our
s will permit. The swarming system of
agement is not only more profitable, but,
ıg a run of years, is better every way, and
: natural than the system that prevents
ming.

ne bee-keeper in the neighbourhood of
chester, who writes on the subject, once
to me that "honey and swarms could
be obtained from hives in the same
)n." I venture to express a contrary
ion. Now, during the last three years
best swarms every year have risen in
ht to 70 lb. each, and sometimes more,
eas his non-swarmers have not ap-
ched that weight—nay, my old stock-
ı, after yielding one and two swarms
, have been as heavy as his, which never
med at all. All this has not been owing
eir being allowed to swarm, but partly to
ize of the hives and our system of man-
ıent.

ıt after making many trials we can state
in good seasons for honey, a good early
n will, at the end of the season, weigh
than a hive that has never been per-
d to swarm at all. A swarm put into
npty hive is doubtless placed at a great
vantage, and apparently will never both
ı hive with combs and gather as much
y as the old one already full, weighing
ps 30 lb. or 40 lb. But wait a little; the
n which is far behind during the first ten
afterwards rapidly gains upon the old
and generally overtakes it when they are
about 70 lb. or 80 lb. each; the young one
goes a-head, at the rate of 2 lb. for 1 lb.
besides the great superiority of the first
ı over the hive which did not swarm, there are the mother hive and probably a second swarm, weighing by the end of the season from 40 lb. to 80 lb. each.

If asked to explain how it is that swarms put into empty hives gather more honey and do better than hives not weakened by swarming, we might not be able to do so satisfactorily.

However, we may venture to guess, or give our opinion, as to the reasons why good early swarms of the same or current season out-do those that never swarm at all.

1st, The stimulus of an empty hive makes the bees work harder. In the absence of combs, all the eggs laid by the queen are lost. Combs *must* be built to hold both honey and eggs. For the first two or three days, the greater part of the honey gathered is eaten by the bees *with a view* to secrete wax for comb-building, which goes on with marvellous rapidity. Liebig thinks that it takes 20 lb. of honey to make 1 lb. of wax; but let us suppose that 2 lb. of wax is manufactured from 20 lb. of honey. Now, in good-sized hives there are about 2 lb. of wax. We have known a swarm fill, or nearly fill, its hive with combs, and gain about 28 lb. weight in ten days.

2d, The combs of swarms are clear and free from a superabundance of farina or bee-bread; therefore the cakes of brood will yield a young bee from every cell, making the hatch of the swarm considerably larger than the old hive. By the end of the season a swarm is much more populous than the other which we have been comparing with it. Even a second swarm, in honey years, will sometimes pull itself abreast the stock or mother hive, with a weight of 30 lb. to gain.

By swarming we double and often treble

the number of our hives annually, and therefore have two or three queens laying instead of one.

3d, By the adoption of the swarming mode of management we can change our stock of hives every year; that is to say, we can set aside one of the swarms for stock, and take the honey from the old one and other swarm, and thus our stock is full of new sweet combs, and free from foul brood, which is a great advantage. No hive should be kept more than two years, as old combs are objectionable for many reasons, and ugly to look at.

Besides all these considerations, there is, in the swarming system well carried out, the certainty of success in bee-keeping. On the non-swarming system, hives are comparatively weak in bees in early spring; whereas, on the swarming system (as we recommend it to be done), the hives are of great strength and power, even in early spring. And we maintain that ten strong hives will do more work than twenty-five weak ones.

4th, On the non-swarming mode of management the queens become old and die; and at the time of the death of a queen there is a loss sustained. The hive in which she dies is without eggs for three weeks, or thereabouts; for ordinarily the young queens are not matured till about ten days after the old one dies, and it is ten days more before she begins to lay. But there is the risk of the loss of the whole, for if the queen dies when she is not laying, the bees cannot raise a successor.

Now, in the swarming system, the bee-master may have nothing but young queens in his hives, by destroying the queens of the first swarms when the bees are united in the autumn. We hope we have made this matter so plain and simple that none will misunderstand our meaning. If the bee-keeping reader is seeking knowledge on the question before us, we trust he begins now to feel his feet touching pretty solid ground.—*Pettigrew's Handy Book of Bees.*

The Dairy and Poultry-Yard.

FOWLS ON AN OLD FARM.

OUR friend B., says the *Ruralist* (Massachusetts), is an old farmer. He lives on the farm where he was born, and which his father, whom we can just remember in his very advanced age, carried on for years before him. When the place descended to the son, it descended with all the old man's habits and ways of farming, and we do not see that there has been any change in them for years. The farm produces the customary crops of a moderate New-England farm—a little more than enough each year to support the family, and the wood lots furnish the ready means at all leisure times of adding small sums to the surplus. Our friend does everything in moderation, keeps employed, has few and simple wants, and, take it all in all, in his manner, makes life a success.

We began this article, intending to speak of our friend's fowls, and so we will go directly to the subject. His rule is to keep over about twenty, selling or eating any surplus. From these he gets an abundance of eggs for his family, and has a good many for market. He believes in barn-yard fowls, and has the curious mixture of all colours, but a great uniformity in size. In winter, of course, he is obliged to feed them, although they pick up a good deal about the barn towards their support. He never shuts them up, so that a large part of the year, from the hog-pen, barn, and barn-yard, waste of the house, waste grain and seeds, and worms and bugs about the farm, they pretty much support themselves.

Would you like to know how he can let them run at large, and have anything grow on his farm? Well, they keep about his house and barn summer and winter, seldom taking a wide range therefrom. His garden is at some distance, and they rarely go to that; but occasionally they pitch into a corn field, or potato patch nearer the house. This he stops at once by a novel method, which he claims to be entirely of his own invention. As soon as he sees any signs of mischief of this sort, he catches the fowls and cuts off the nail of the middle toe, close up to the end of the toe, so that it bleeds a little. They will not scratch for two or three weeks, and he renews the operation if necessary. We asked him if he did not consider this a petty kind of cruelty that a farmer ought not to be guilty of. But he could not see it in that light, and said he had practised it a good many years with great success, without any apparent harm.

His flock is never troubled with sickness, and the birds are all sprightly and lively. It seems reasonable that they should lay better and be better for the table than fowls that are crowded together in a small space. Particularly is this so in warm weather, when they are obliged to take such food as is given them, and have no benefit of a choice which the green fields afford them, or of the open-air exercise which they get while roaming about and making that choice.

We keep our fowls guarded during the garden and flower season, but we confess we do it only from necessity. The best-off fowls are those that roam at large where they will. The next best are those where their enclosure is measured by acres, according to their number. Those who are obliged to confine them in small enclosures must suffer therefrom, but can make up in care and cleanliness somewhat for what they lose in space.

POULTRY AND BIRDS.

IT appears to me that I must say a word on behalf of farmers' wives who have to keep poultry as a source of profit, and who sometimes get considerably snubbed by their husbands, who grudge the destruction of a few rods of corn or clover, and who evidently don't reason on the matter, and don't or won't understand either the habits or the profits of poultry.

A farmer will readily turn a large flock of sheep to trample on and drag down a fine field of clover or grass, but he would be much annoyed to see half an acre eaten by his wife's poultry. He will give his pigs barley and beans by the sack, but objects to the poultry helping themselves to their kernels. By-and-by I will tell him which pays best for their food, for I am sure he has never entered into the question. Let us now consider the habits of poultry. Take my own as an instance, for some 300 of them have free access to all my fields (no fences to obstruct them) from the early morn to dewy eve.

As soon as the fowl-house door is opened they receive their morning meal of barley ; they then at once betake themselves to the fields—for what? Observe them. That wonderful eye of theirs examines everywhere, and, quick as thought, they appropriate every fly, slug, worm, or insect on every blade of grass or clover. This is their occupation during the whole day, except when at rest or when grazing—for poultry graze equally as do sheep or cattle—and it is essential that a piece of pasture should be near the fowl-house, otherwise they will, and must, appropriate your young cabbage, turnips, or mangold plants. They must have free access to water.

What a mistake we make when we cage up poultry, and deprive them of their natural food —green food and insects, with some grain. They are first-class judges of weather. They know by instinct (where does instinct end and reason begin?) when and where their food—insects, worms, &c.—is to be most readily found. They watch for every load of green tares or green beans brought home to be passed through the chaff-cutter, and they at once set to work upon the myriads of insects that infest almost every crop.

They are the most industrious and economical [illegible] creatures—their ready claw and keen eye are ever at work; not a seed of weeds or grass is wasted. In fact, fowls and birds are true farmer's friends, and the farmer can have no idea how many enemies he has (invisible ones to him) in the shape of insects, until he devotes his attention to the operations of his poultry. Although he can neither see his enemies nor know of their whereabouts, the fowls and birds at once detect them, as you may see by their eager darts and rapid movements hither and thither.

Watch a company of ducks toddling along in regular line, for fair play, and they will shew you slugs and insects where you never suspected them. In fact, within a week of leaving the shell the juveniles are on the alert for their natural food, the insect tribe. I could write a small volume on the value of birds, for it is only by watching their habits and good work that the farmer can realize how many enemies he has, and how many friends there are ready to seek for and destroy these enemies.

It is a well admitted fact by all my labourers that my best and thickest crops are in immediate proximity to the fowl-house—commencing at only 10 yards distance. Yes, but see how they are scratching up the seed corn, and what a mess they make. Well, I have seen them at work between the rows of young wheat (and I only put in a bushel per acre at 9 inches from row to row), and I find in nine cases out of ten that they are in search of insects, and they do find them. Gardeners who are sensitively particular about the appearance of their gardens, and hate fowls, see, however, what takes place:—An intelligent chemist took to a garden where insects had long had undisturbed sway, and devoured everything. He was fond of poultry, and understood their habits, therefore he gave them free access to his garden ; they cleared off the enemy, and he had plenty o everything. No doubt there are times when you would protect your fruit, or your shallow sown seeds. In my case I sometimes employ a boy for a fortnight immediately after drilling close to the poultry-house, but even when I have not done so, I have scarcely been inconvenienced if the grain was properly deposited by the drill. The hen-coops and broods of chickens are always placed on a patch of grass edging the wheat or barley fields ; and if, when the crops are ripe, they help themselve a few sheaves, I know they are good custo- ers, for they must be fed (like sheep, or pigs, or ttle); and they always sell for double the price r lb., although they cost less to produce. artridges are great friends to farmers, although ey don't always believe it. There is no surer gn of imperfect tillage than when you hear of rds and game getting out the seed. What I ll imperfect tillage is ploughing the land and en merely scratching the surface with light ooden harrows, so that the seeds are close to e surface, and under them are unbroken fur- w slices—long, hard lumps of undivided and nbroken earth, in the case of strong soils lmost as tough and impenetrable as weather oarding. In my case I always use heavy iron arrows and deep steeled teeth that cut the fur- w-slices into mould, or sometimes cultivate ith the cultivator harrow before drilling, and enerally the surface has been well scarified be- re ploughing, so that the seed is not only pro- erly deposited, but where it grows the young bres find mould below to work in.

For want of this proper tillage I have seen eat losses; the fine fibres cannot work into the eat lumps of undivided plough slices which, in iff clays, are nearly as hard and as whole as eather board. I don't believe that one farmer ten can tell me what price per lb., live eight, he gets for his poultry, and for his beef d mutton, but I will tell him :—5s. per stone of b. is 4½d. per lb. live weight of beef, and nearly out the same for mutton. Now, as good poul- always sells for at least 9d. per lb. live weight mean wholesale), and as they cost no more r lb. to produce than beef or mutton, it fol- ws that we gain 100 per cent. by poultry as mpared with meat. I have tested this care- ly. In fact, I know the difference is greater an this, because I have frequently sold poultry 14d. and 16d. per lb. live weight, or more than ree times the price of meat. When we sell a icken, the purchaser pays for head, skin, feet, trails, and all but feathers (which sell for more an the carcase per lb.), but when they buy eat, the feet, skin, blood, &c., are removed, d called offal; consequently it requires no njuror to convince the heads of families that ultry is dearer by 100 per cent. than meat.

But should poultry be so dear? I answer, decidedly not, if we, as farmers, did our duty to ourselves, our land, and our country. The demand is evidently in excess of the supply for both poultry and eggs, for we import immense quantities, and, in addition, 500,000,000 of eggs annually! In a former paper I gave you comparative trials of the consumption of barley by a hen and a pig, much in favour of the hen. Of course, your poultry breeder must understand the business, as must the breeder of other farm creatures. The edge of the fields is the proper place for juveniles, and not cooped up in yards and sheds. Mine are not fancy poultry. I breed from pure stock on each side, say game, Cochin China, and Brahmapootra, all running and mixing together. I like Dorkings, but they won't thrive on our stiff clays. Every two or three years I change the male birds, paying 21s. each for young well-bred ones. We send them to the wholesale salesmen in London, ready plucked.

The hen-houses should have asphalted floors, be kept clean, well ventilated, and occasionally lime-washed; the slated roof lime-washed in hot weather.

A farmer never grudges barley by the load for his pigs, and cake and corn for his other stock; why should he regret feeding his poultry? We should consider that poultry manure the land the same as any other farm animal.

As we are doing away with our trees and fences, there should be plantations on every farm for birds to build in; and we should have plenty of poultry and partridges—the latter for the farmer's table, if not for his sport. It is well known that many a farmer's wife clothes herself and her numerous family by the proceeds of her poultry. In some cases that I know of, one of the farm hands receives a pint of beer when the governor is at market to carry in a sack of barley on the sly for the use of the poultry, so as not to shock the farmer's excessive and unreasonable prejudice about the unprofitableness of poultry.

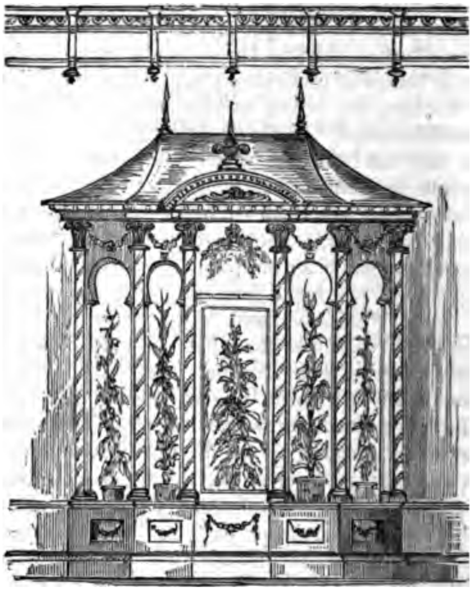
The hen-house floors being asphalted, and swept daily, and having no open farm-yard knee-deep in straw, we know nothing about fleas.—*J. J. Mechi, Tiptree, Aug.* 2.

The Country Gentlewoman.

DRAWING-ROOM PLANT CABINET.

IT has been asked who, in the reign of Queen Elizabeth, would have planned a library, a music room, a billiard room, or a conservatory? The most advanced disciples of the Inigo Jones' school, notwithstanding their ambition for what might be called additional refinement, had always to square their plans and projects in some degree with fashion. To be sure, they were expected to lead the way in their particular department, but it is only the very few that can give stability and permanence to the plans of a master mind. If wealth were unlimited, the resources of some minds, finite though humanity be, are so unbounded as to originate and perfect, for instance, the details of a structure of marvellous magnificence. But our object, in the meantime, is not so much to diverge in the direction of discussing the general character of architectural advancement, as it is to look into some of its more useful details. In these days a library, a music room, a billiard room, and a conservatory, are accepted as necessary adjuncts of a model villa, quite as necessary in their way as the public rooms or any other rooms of the house. It is not every house, however, that has a conservatory as an adjunct, and it is not every house, let it be said, even where modern comforts and elegancies are studied, that is quite in suitable position for having such. In rural and suburban villas there is ample space; but in purely city residences there is not. Moreover, to be quite in keeping with the villa, the conservatory must be of some extent; and, not to speak of first cost at all, after-keeping is a matter for serious consideration; therefore we must cast about in some other direction for a place or room suitable for plant life, or abolish the idea and pleasure altogether. That is not quite so easy a matter with such as have learned to enjoy the beauties of plant growth, and long to possess some of the individuals on their own account. What's to be done in the emergency? Our engraving will in some measure shew.

Ladies have been accustomed either to think that the most ambitious receptacle for plants in-doors was the Wardian case, the window sill, or the mantel-piece. Not so, however, there is another sample of our bran new plant cabinet which we make a present of to all our interested readers. It is a more expensive article than the one formerly recommended, and is intended specially for a drawing-room. What could be more suitable for one of the withdrawing-room windows than this? What article of furnishing more elegant, and none presenting the same sort of kaleidoscopic beauty, looking to the ever-



Drawing-room Plant Cabinet.

changing characters of the inmates within. It is just such a thing as might please even the beautiful Lady Corrinne herself. Some at first sight may exclaim beautiful, and then pout out the inconvenience of shutting out the light, of curtailing the ventilation, and of the glass walls of the cabinet itself standing in the way of personal inspection.

It will, in a measure, obscure the light, but there will be sufficient to come in by the other windows, and the plants will only partially absorb the rays.

It need not interfere in any way with due and proper ventilation, for the air admitted from the exterior to the plant cabinet can be re-admitted into the room by the door of the cabinet.

Personal inspection can be made in this design as in any conservatory. The lady of the house can withdraw into her plant cabinet by the door, inspect her choice flowering plants and climbers, and spend an agreeable twenty minutes in tending, watering, assorting, or dressing the various plants, which is quite a lady-like employment, and then resume her other duties.

There scarcely can be an adequate idea formed of how much real enjoyment could be had in watching the development of handsome fronds of choice ferns, of the particoloured foliage of decorative plants, and, above and beyond all, of the opening of beautiful flowers. It is so rare, unless in the bulb season, that ladies can count upon flowers expanding within the atmosphere of living rooms, that anything that can assist in bringing about so obvious a desideratum must be an immense gain. The Wardian case presents too limited an atmosphere for purely flower culture, that foliage is recommended instead. The little climate is so bathed in moisture, that flowers, if they expand under its influence, soon get destroyed. In the cabinet can be grown that elegant plant the fuchsia, and by a little indulgence in the way of attending to a change of air and a bath every morning and evening, there will come quite a crop of beauteous flowers. The same remark applies to the more useful zonal pelargoniums, to Japan lilies, to balsams, to achimenes, and to many other plants cheap and good, as well as to a variety of climbers, not the least useful of which, for a place of this kind, is the Lapageria rosea.

We could extend our remarks upon the point of furnishing the plant cabinet with foliage plants and ferns, and with plants suitable for growing in suspended baskets from the top of this erection, but enough has been said to shew how useful the proposed cabinet would be, and yet, withal, in keeping with the style of the best furnished drawing-room of modern times.

A low stage to raise the pots a little above the ground is desirable; firstly, to bring them more in direct contact with the eye, and, secondly, to provide against the escape of drainage water, so that all things can be kept in the pink of order. This can be better described in a future number, when we give a plan and section of the Plant Cabinet.

Flowers everywhere! is the general exclamation in homes of taste; and quite a proper thing too, we rejoin. On the mantel-piece of the drawing-room might be placed a vase filled with cut flowers. How admirable even a limited quantity of cut flowers look, mixed and embroidered with well-chosen foliage! How well does the spacious room, with its gilded cornices and elaborately decorated panels, become the flowers, and equally so do the flowers become the room! Reflected in that spacious, spotless mirror, they look even more enchanting than growing upon the plants. Little wonder that ladies are so ready with their scissors in conservatory and flower border to obtain the wherewith to make up such a pretty *tout ensemble* of flowers and foliage. And then in the heat of summer the lives of many of the flowers are prolonged. May Flora continue to hold undivided supremacy in the hearts and homes of the ladies of England, aye, and as our cousins over the water say, of the fair of "all creation," as well!

WINDOW GARDENING.

"HOW shall we make our windows less gloomy than they are? How can we manage to get a bit of the beauties of Nature introduced without discomfort or inconvenience?" Such questions are often raised by those who long, if not to enjoy country life, to have something else to look upon than those everlasting piles of brick, and mortar, and cement. The interior is right enough, for we have many comforts in our furnishing and embellishments for which we ought to be very well satisfied, but the look-out is not quite in keeping with all our in-door elegancies, and if something could be devised which, while not interfering with the ingress of light would intervene between the eye and what is objectionable, it might serve to make us forget, now and again, that we are destined to dwell in cities.

The accompanying engravings are introduced to shew a way, and a very capital and effective way, of escape from these little difficulties raised. Figs. 1 and 2 shew an aquarium fitted into a window case so that the whole can be transferred, like a piece of furniture, when change of residence is decided upon. Such designs can be made of any size, but the size in the engraving is a very ordinary one suitable for the windows of most of the tenements that have been constructed in modern times in our cities.

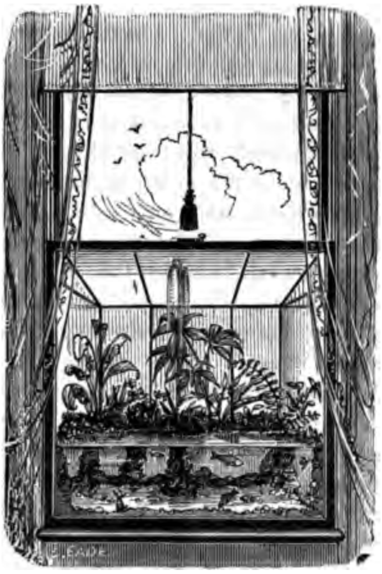


Fig. 1.—A Window Garden—inside view.

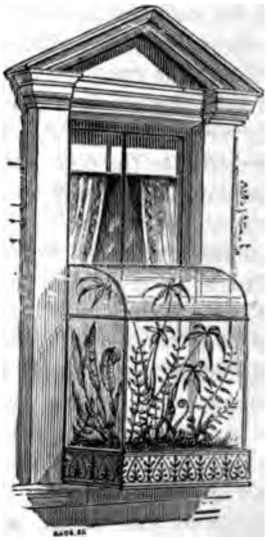


Fig. 2.—A Window Garden—outside view.

But the charm of the sketches consist in the representation of both animal and plant life in beautiful congruity. Water is pleasant at all times, and the eye rests complacently upon it. Associated with plants, and these plants growing out, as it were, of the formal aquarium in variable outline, the picture of life is beyond question both pleasant and agreeable. To keep water fresh and clear as the brook, is or ought to be the order of the day; but this could not be unless the root dominion was confined within the area of pots of some form or other. That is one point that must be considered in the furnishing of the aquarium. Another point is, that it ought to be connected with both the flow and discharge pipes of the house, in the one case, to provide a fresh supply when needed, and in the other, to allow the stagnant water to pass off without the clumsier means of emptying sometimes had recourse to. The ladies will insist upon this as a matter of order and economy too, because spilling water, statedly even, is not quite in accordance with the proper keeping of a well-furnished carpeted room. Moreover, to attach the aquarium to the general water supply of the house, enables the lady superintendent to have a little fountain continually playing and discharging its bright particles of spray over the area of the case. This is so obviously sanitary in its way, for both the plants and the fishes, as to commend itself to every plant admirer and naturalist.

As to plants there might be a variety quite as great in this aquarium as in many Wardian cases. It must be understood this is not quite the suitable home for flowering plants, but for some of the free-growing ferns, for Sarracenias, for Crotons, for some of the little Nymphæas, and the beautiful Villarsia, which is a gem of a water plant and could be grown in a pan in this aquarium. With the gold and silver fishes swimming gracefully round the little islands of earth, and, as it were, playing hide and seek with one another, and the foliage of the plants in a healthful state in the glass case above them, there are indeed charms presented to every onlooker, which must be both irresistible and enchanting.

Now that such sketches are presented and made known through the medium of our pages (for the designs of which we are indebted to Messrs Dick Radclyffe & Co.), they cannot fail to impress many of our readers in making the necessary arrangements to secure and fit them up in at least one of the windows of the house. Although mainly advantageous for city dwellers, their merits commend them for both villa and country residences.

LIBRARY WINDOW.

From THE VILLA GARDENER.

SEATED at his window, and gazing on the extended landscape before him, bathed in a glorious sunset, how can a VILLA GARDENER critic write unkindly of those who are the makers of books? Yet we find that he does, and a few tremendous rods in pickle are now in reserve, to be used as occasion requires. Our critic, judging by the manner in which he has put a frame to a beautiful landscape, is evidently a man of taste, for how exceedingly simple are the materials he has so gracefully made into "a thing of beauty."

Let us see how he has set about it: first, there is his writing table. This we find is mounted on good castors—

"Yes, my dear madam, there is a reason for it, as you will presently learn."

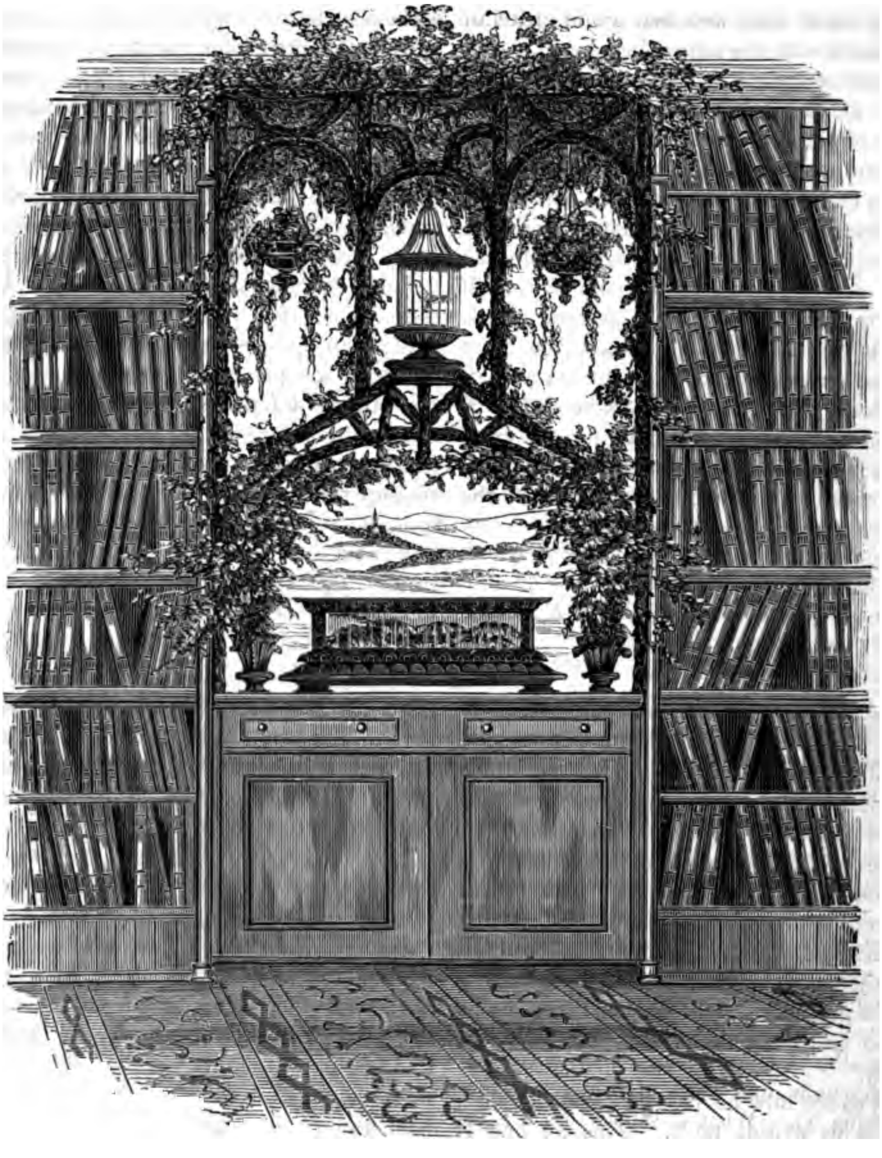
Upon the table stand two flower-pots of ornamental design, in which are growing two vigorous plants of the small-leaved variegated ivy, which are trained carefully over the trellis.

"I perfectly agree with you, my dear young lady. The drawing is not at all like an ivy, but that is more the fault of your humble servant than the engraver, for he had only a rude sketch to work from."

The semi-rustic trellis tells its own tale. It is securely fastened by thumb-screws to the top of the writing-table by copper rods and screws. In fact, all the metal employed is of copper as being not liable to rust. A few hanging baskets with any common trailing plant, the Kenilworth ivy, for instance (toad flax), will do very well; a bird or two in a cage, and a small aquarium, and you have the whole complete. To add to the effect, the window is made of one sheet of plate-glass.

"Very pretty, very pretty, indeed," says Mrs Merchant Prince, who lives at Mentone Villa; "but how do you think my servant could clean the window with all *that* in front, and George is *so* particular about his window?"

"A little patience, and I will tell you how this is done."



Our Library Window.

The table, as already explained, is on castors. When the window is required to be cleaned, the small aquarium is first lifted from the table, and the table is gently drawn from the window to give access for cleaning. The window can at all times be opened for ventilation by an ordinary pulley without moving the table.

It is necessary to hang a light cloth before the trellis and window before sweeping the room, so as to preserve the plants from dust as much as possible. When the foliage appears to require syringing, the entire trellis may be removed from the table, including the two couple of servants, or rather, my am, I would say, yourself and your You will find it pretty firmly gether by the copper rods. It may aken out of doors, and subjected to h washing with that useful little implement, the Hydronette.

it is nice—so *very* nice," says young hant Prince, "but how can dear rite upon a table covered with such ings?"

hat might have been a poser had window only existed on paper; but due provision has been made for all that, for what appears to be a drawer in front is in reality a commodious writing-desk, which draws out completely.

"Well, I never!" "Now did you ever?" exclaim a chorus of sweet voices.

And thus the pretty design is carefully studied, and at least half-a-dozen loving husbands and brothers will, ere a couple of months have elapsed, be writing before similar windows, if one fourth of those who admire are determined to carry out their plans.

NEW USE FOR OLD UMBRELLAS.

RE'S a skeleton in every house— an umbrella, I mean, or a parasol unshade. If not, where's that old each of us borrowed long ago and eturn? The thing is cracked and w, and it is impossible to remember hich of our dear friends we dulled of husbandry by the borrowing. would ease our conscience to tear gy covering (of the umbrella, not ence), stand the poor skeleton out and twine something green about ly as possible. Perhaps we shall dilapidated parasol hidden away e. If so, we 'll dismantle it and h us; but, if you please, we won't s mate, so as to place a little one de of the big umbrella for the sake ity.

what could be finer? We've he rattling thing, sharpened its andle, and stuck it firmly into the g. 1). What a satisfaction it is to top part just to the angle we fancy, to press the ivory tips into the that all further opening and shutossible. That's the umbrella. It charming on this little rise of the n the plants have crept to its top. an set the parasol-skeleton in the centre of this little flower-bed. Ha! perhaps the owner's name was on the umbrella-handle! Well, it's too late now to look. After all, such petty details are only fit for the groundworms.

Now for the planting. There are any number of plants and trailing things that would be delighted to creep up over these inviting frames. The sweet pea, nasturtium, Lophospermum Hendersonii, Cobæa scandens, Eccremocarpus scaber, Maurandya Barclayana—any of these would be lovely. The fact is, we should have a dozen umbrellas

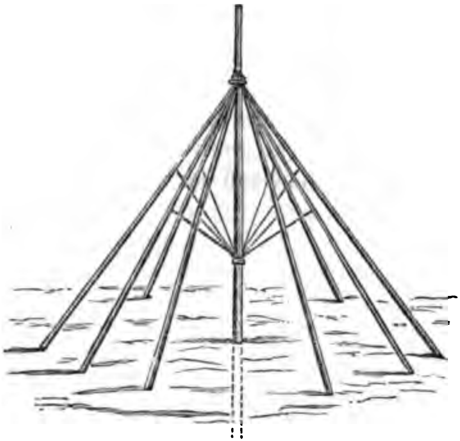


Fig. 1.—An Umbrella Frame in position.

instead of one. It would be fine to have one covered with Loasa aurantiaca. All things considered, however, I think we 'll select the canary-creeper (Tropæolum canariense) for the umbrella, and Maurandya Barclayana for the parasol, as these happen to be the only kinds that we have got started.

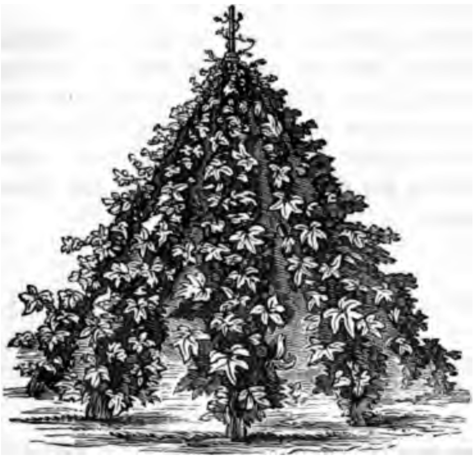


Fig. 2.—An Old Umbrella re-covered.

Next season these things *must* be attended to in time. What a pleasant time we shall have training up the tender shoots! and what a beautiful sight when at last there is a feathery pyramid of green (fig. 2) all hung with dainty blossoms!

I am glad our frames are of the old-fashioned whalebone sort, because steel ones, unless painted light green or white, might heat in the sunshine and injure the plants. However, if at any time we wish to use steel frames, we can set them in shady places, and select plants that don't require much direct sunshine. I'm glad, too, we didn't carry out a plan that flashed upon me a few moments ago, though it had its attractions. This was to have two or three kinds of plants trailing over one frame. Some pretty combinations might be attained by this method; but then the effect might, in some remote way, seem to sanction those fearful pyramidal bouquets which they *will* award prizes to at flower-shows—hideous monstrosities that are positively insulting to the soul of beauty. I'd feel sorry to have anything on the lawn that Mrs Gog or Magog might long to carry off bodily to a giant's party.

Here come the children with a wee wreck of a sunshade. There are two "spokes" out they say, and part of the handle is gone. But what matter? Strings are always with us. We can supply deficiencies, and have an admirable little trellis for some creeping procumbent plant, that will look all the prettier for being slightly lifted from the ground.

What a pleasant thing it is to have a new idea—in the country! As you try to carry it out, sky, trees, bushes, and all seem to be looking on with so much interest. And then, the children—it certainly has a good influence upon them to see any effort for the promotion of the beautiful. Who would have supposed that our little family could have been put in such a glow as this by three skeletons?—*H.B.*

THE

JNTRY GENTLEMAN'S MAGAZINE

OCTOBER 1870

LORD DERBY ON SANITARY REFORM.

RD STANLEY has never been regarded as a purely party man. He ıked upon in the House of Commons, ɔarties in the State, as a man singularly ninded—devoid of that passion which nes carries one attached to a party l the regions of fair-play towards an ɛnt. He always recognized right on :s, and never failed to acknowledge it hen it happened to be on the side of the ition, or wrong on the side which was ɛd to be his by hereditary associations. the coronet decorated his brow, his has been one of the same impartiality ls all parties, as it was before. His on to the seat occupied by his father, iery Rupert of debate," has made no ɛ in him. He is still the same calm, ıting speaker (not eloquent as his father as he was wont to be in the Lower :, with the same desire to promote all ts that tend to social and sanitary re-

h Lord Derby's political views, of course ıal of the character of this magazine › more to do than agricultural societies, for the most part, have rules to the that political matters are strictly ex- l; although, at times, to use the words ns,

> "Men and mice gang aft agee;"

ɔccasionally we find at these society ıgs subjects broached which scarcely fall within their province. They trench too much upon that which is specially regarded as party politics, when they ought to confine themselves specially to those matters which, having a bearing upon politics, have so only in their relation to the vital interests of agriculturists—such as the Gun-license, the Game-laws, the Law of Hypothec, &c.

Lord Derby's speech at Boottle, near Liverpool, does not fall within the sphere of party politics. It has far wider significance. It has as much interest for our rural population as for the dwellers in cities or their suburbs. Comfortable cottages, good drainage, cleanliness, are as essential in the farming districts as in towns, and they are as scarce. The death-rate of many parishes, whose inhabitants are supposed to be breathing the pure air of the country, is larger than in some of the most populous cities, and, *prima facie*, this ought not to be. We trust, therefore, that the remarks made by Lord Derby, in laying the foundation-stone of a new hospital, will be laid to heart by landed proprietors generally, and, laying them to heart, that they will carry them out into practice, and replace the wretched cottages which now exist in many parts of the country, with others suitable for human habitation. His Lordship's remarks were:—

> I don't think it is any exaggeration that, if you deduct from the total sum of disease at any one time existing in the country, all that can be clearly and unmistakably traced to human and preventible causes

—to obvious sanitary deficiencies on the one hand, or, on the other, to vice or folly, or both, either in the individual suffering or in his parents—you would have a comparatively small amount to be dealt with. Recollect that these are not matters in which any statistics can help you. You may be able to shew how many people die of bad drainage in some particular place, or of the effects of drink or other vices, but no figures can give the infinitely larger sum total of strength broken, and constitution ruined from the same cause, the number of instances in which no immediate result is seen to follow, but when some slight and casual attack of illness comes on, the man previously weakened has no power to resist it, and dies. Take, again, the innumerable instances of an entirely sedentary life, without due air and bodily work on the one hand, or, on the other hand, where excessive exposure and physical fatigue have destroyed health and shortened existence. Take the over-crowding and foul air which so helps up the death-rate in our great towns. Take the painful, though happily rare, instances in which death has been produced either entirely or by a process of slow and general decay, through absolute want of food. Look at all these things, and the more you look at them the more surely you will accept the conclusion that, in sanitary matters at least, the future of the world need not be like its past; that for the worst of the material evils that beset us, the cause is not in the arrangements of nature, but in ourselves; and remembering that this is the age of great towns, and knowing what are, in a sanitary and moral point of view, the defects and the difficulties of great towns, and bearing in mind what I am afraid there is no doubt of—that an urban population not recruited from the country cannot keep life permanently in itself, but tends inevitably to decay and die out—considering all these things, I say you will be at no loss to see what our business is, and to some extent to see how it is to be done. We want here broad streets, good drainage, plenty of light, and plenty of air. These are the first requirements, and for so much I will undertake to answer so far as my interest in Bootle is concerned. But we want more. We want good and cleanly houses for our working men; we want baths and washhouses; we want places of healthy exercise for those whose labour is sedentary; we want places of rest and harmless amusement for all when their labour is done. One thing we have to remember (in theory we all know it, but in practice we are apt to forget it), that the true wealth of a state is not shewn in the list of its exports and imports, nor in a vast revenue easily raised, nor in its enormous yearly savings, of which our statistical writers boast. All these things are excellent in their way, but, excellent as they are, they are means, not ends, and the end of them all is that we should have living on this English soil a population, not squalid with dirt, not deciminated by disease, but healthy in body and mind, trained for all needful purposes, whether of peace or war, living in houses which make self-respect possible, and attached to a country which has done its duty towards them.

RT AND EXPORT OF AGRICULTURAL COMMODITIES.

Board of Trade Returns for the onth, and seven months, ending ave been issued. On the month been a decrease in the supplies of n abroad to the extent of upwards ead; the import of calves is slightly of sheep we have received about ewer. There was an increase of o in pigs. Looking at the great n in our animal food supplies e seven months, and to the arid of our spring and summer, we are ss to account for the high prices ef and mutton have now attained; xportations to France may, to some tent, give them a further upward . As compared with the first seven f 1869, our imports of cattle were oo head fewer, only 75,244 as 17,879; and the decrease in sheep l to 90,000—the figures for the por- this year to which the Board of eturns are made up, and the corre- period of last, being respectively and 478,291 head. There were not lambs within 1300 imported, but ore swine.

pplies of wheat for the month have e than 1,200,000 cwts. less than in sponding month of 1869, the de- being chiefly noticeable in the rom Prussia and the United States. even months we have had an in- 400,000 tons. The following table ence our supplies were derived :—

	Seven Months ended July 1869.	Seven Months ended July 1870.
....	3,840,612	5,177,209
k.................	238,681	222,742
....	2,652,741	1,689,684
g-Holstein, burg	29,321	10,736
burg............	387,710	313,687
y forward	7,149,065	7,414,058

Wheat.	Seven Months ended July 1869.	Seven Months ended July 1870.
Brought forward	7,149,065	7,414,058
Hanse Towns..........	384,261	240,738
France....................	179,367	18,998
Illyria, Croatia, Dalmatia..................	6813272	42,327
Turkey, Wallachia, and Moldavia.......	1,243,247	252,806
Egypt.....................	458,532	95,550
United States...........	5,165,492	7,244,705
Chili........................	332,451	277,697
British North America	442,726	978,832
Other countries.........	265,354	156,286
Totals.........	16,303,767	16,721,997

The quantities of the other cereals received up to the end of July were as follow :—

	Cwts.	Cwts.
Barley............	5,087,086	4,438,414
Oats..............	3,197,514	5,727,828
Peas..............	462,090	1,166,589
Beans............	1,095,057	902,213
Indian corn.....	8,681,048	8,023,602
Totals.........	18,522,795	20,258,646

The total quantity of wheat-meal and flour received in the seven months of the year, was 2,839,204 cwts., in the same period of last, 2,349,545. There was a great increase in the supply from the United States, which sent us nearly one-half of the imports, and more than twice as much as in the like period of 1869. The price we paid for foreign wheat, up to the end of June, was £6,777,696, about £350,000 less than in the first half of last year. We paid less for barley by half a million sterling, £600,000 more for oats, and a quarter of a million more for wheat-meal and flour. The total amount paid for bread-stuffs in the first half of the year was £14,389,628, and in the first six months of last, £13,547,735.

Our imports of butter were considerably less during the seven months, 596,094 as against 643,203 cwts. Cheese came more freely; 350,085 cwts. to be compared with

293,439. There was a falling off in the import of eggs to the extent of seven millions, the numbers being 286,438,800, to compare with 293,802,480. Of flesh and slightly salted meat we received a larger quantity than in the previous year, and many people would like to see more coming to us this way, instead of alive; as the more we get in carcase we lessen the chances of bringing over disease to ravage our own flocks and herds. There was a diminution in bacon, hams, and beef, to the extent of 60,000 tons; and 4000 tons increase in pork. Potatoes continue to come in diminished quantities, 649,191 cwts. In the same term of last year, the imports were 1,154,933 cwts.

In reference to our manurial substances, the increase in the imports of guano, which we noted in previous months, has continued throughout July. The quantity received was 145,595 tons, while, up to the end of the same month last year, only 60,483 tons had been landed at our ports. There was a slight augmentation in the receipt of bones, 45,511 tons to compare with 43,247.

There was a falling off in oil-seed cakes to the extent of 10,000 tons, the quantities being 80,122 tons and 90,488 tons respectively. Cotton seed was in more demand, 87,694 tons being received, instead of 78,012 tons. The imports of rape exceeded, by upwards of 80,000 qrs., those of the same period of 1869. There were fewer imports of clover, and of flaxseed and linseed.

Flax was sent in much greater quantity than in the same portion of the previous year, viz., 1,20[illegible],207 cwts., as against 6,865,[illegible]53 cwts. These figures should induce farmers, especially in Ireland, where the soil is peculiarly well adapted for its growth, to devote even more attention to the cultivation of flax than they have yet done.

In the seven months, the imports of wool amounted to 184,821,809 lb., or about 1,400,000 more than up to the same date in 1869. The whole of the increase, and more indeed, as some of the other countries we import from did not send so much, came from Australia. From the Hanse towns and other parts of Europe we had 8,657,740; British possessions in South Africa, 15,931,481; British India, 4,719,602; Australia, 145,930,405; and other countries, 9,582,581 lb. Of this quantity we transhipped 69,122,459 lb. to foreign countries; the previous year being only 61,491,249.

Turning to the other side of the account, we find that we exported of home-raised produce, bacon and hams to the value of £61,098; beef and pork £13,174; butter £160,204. As we anticipated there would be, on account of the demand for war purposes on the Continent, there is a great increase in the number of horses exported in July. In the same month last year only 84 were sent abroad, last July the numbers mounted up to 877. In the seven months, however, the number only exceeded by 52, those of last year being 1706 as against 1654; and the value was less, being £79,936 as against £96,047. The value of the home grown wool supplied to foreigners was £339,107; in the same period of last year it reached £455,599.

IRISH AGRICULTURAL STATISTICS.

TURN of the Agricultural Statistics of
eland, shewing the comparative number
e of horses, cattle, sheep, and pigs, in
in the years 1869 and 1870, has been

return gives the figures of the various
es, as follows :—
ter.—Horses, 1869, 166,603 ; value, at
h, £1,332,824 ; 1870, 166,838—value, at
h, £1,334,704. Cattle, 1869, 950,901—
t £6, 10s. each, £6,180,857 ; 1870, 946,020
, at £6, 10s. each, £6,149,130. Sheep,
1,546,859 — value, at £1, 2s. each,
545 ; 1870, 1,421,618—value, at £1, 2s.
1,563,780. Pigs, 1869, 289,282—value,
s. each, £361,602 ; 1870, 343,469—value,
s. each, £429,336. Total value of horses,
heep, and pigs, 1869, £9,576,828 ; 1870,
950.
ter.—Horses, 1869, 135,027—value, at
h, £1,080,216 ; 1870, 187,231—value, at
h, £1,097,848. Cattle, 1869, 1,163,159 ;
at £6, 10s. each, £7,560,534 ; 1870,
3—value, at £6, 10s. each, £7,755,040.
1869, 1,186,041—value, at £1, 2s. each,
645 ; 1870, 1,084,188—value, at £1, 2s.
1,192,607. Pigs, 1869, 414,720—value,
s. each, £518,400 ; 1870, 542,397—value,
s. each, 677,996. Total value of horses,
heep, and pigs, 1869, £10,463,795 ; 1870,
,491.
r.—Horses, 1869, 166,216—value, at £8
1,329,728 ; 1870, 165,768—value at £8
1,326,144. Cattle, 1869, 1,061,347—value,
10s. each, £6,698,755 ; 1870, 1,078,800—
at £6, 10s. each, £7,012,200. Sheep,
1869, 577,140—value, at £1, 2s. each, £634,854 ; 1870, 540,846—value, at £1, 2s. each, £594,930. Pigs, 1869, 229,667—value, at £1, 5s. each, £287,084 ; 1870, 345,372; value, at £1, 5s. each, £431,715. Total value of horses, cattle, sheep, and pigs, 1869, £9,150,421 ; 1870, £9,364,989.

Connaught.—Horses, 1869, 60,355—value, at £8 each, £482,840; 1870, 60,980—value, at £8 each, £487,840. Cattle, 1869, 558, 268—value, at £6, 10s. each, £3,628,742 ; 1870, 583,412—value, at £6, 10s. each, £3,792,178. Sheep, 1869, 1,341,155—value, at £1, 2s. each, £1,475,270; 1870, 1,304,444—value, at £1, 2s. each, £1,434,888. Pigs, 1869, 148,555—value, at £1, 5s. each, £185,694; 1870, 218,454—value, at £1, 5s. each, £273,068. Total value of horses, cattle, sheep, and pigs, 1869, £5,772,546; 1870, £5,987,974.

Total of Ireland.—Horses, 1869, 528,201—value, at £8 each, £4,225,608 ; 1870, 530,817—value, at £8 each, £4,216,536. Cattle, 1869, 3,733,675—value, at £6, 10s. each, £24,268,888 ; 1870, 3,801,315 — value, at £6, 10s. each, £24,708,548. Sheep, 1869, 4,651,195—value, at £1, 2s. each, £5,116,314 ; 1870, 4,351,096—value, at £1, 2s. each, £4,786,205. Pigs, 1869, 1,082,224—value, at £1, 5s. each, £1,352,780 ; 1870, 1,449,692—value, at £1, 5s. each, £1,812,115. Total value of horses, cattle, sheep, and pigs, 1869, £34,963,590 ; 1870, £35,553,404.

Increase or Decrease in 1870 *compared with* 1869.—Horses, increase, 2616 ; increase in value, £20,928. Cattle, increase, 67,640 ; increase in value, £439,660. Sheep, decrease, 300,099 ; decrease in value, £330,109. Pigs, increase, 367,468 ; increase in value, £459,335. Total increase in value in 1870, £589,814.

THE CHANGE OF CLIMATE.

According to the Sydney correspondent of the *Times*, the Rev. Mr Clarke, President of the Royal Society there, has delivered an address at the sessional opening of that institution, which is of much importance to the colony. There is one part of the lecture which has great interest for people here—that is, the notable change in the climate. We have had much discussion about this of late, but, as a rule, we are not inclined to say that the controversialists generally seem to have had many authentic observations upon which to found their arguments. Most of the writers appear to have been arguers upon theory rather than students of nature. Now, it is some change in the Gulf-stream that has altered the climatical conditions of our country; then it is over-drainage which produces the drought that retards, or completely stops, the growth of our grasses and cereals and roots and brings upon the turnips that pest of flies which utterly devours them as soon as their blade is shewn above the surface of the ground. Then, again, it is the absence of wood which prevents rainfall—the accumulation of moisture in dry parts—the cutting down of trees, is denounced and the planting of them recommended. In the latter recommendation, as means of shelter, as will be seen from another article, we entirely concur. But with regard to what is stated to be the great change in climate, we have not yet [illegible] sufficient evidence [illegible] satisfactorily. So, i[illegible] anxious. [illegible] period — earthquakes, displays of aurora, [illegible]gular gales, absence of hot winds, sudden storms, [illegible]pical rains disturbing the usual order of summer [illegible] dressing the ground with a mantle of verdure which rivals the freshness of an English spring. We may not be able to explain it all just yet, but when the time arrives, we shall probably learn that a great disruption of ice has, within a year or so, taken place from the Antartic barrier.

A south wind during November was the prevailing wind, though, as we learn from the tables of my colleague the astronomer, a north-east wind prevailed that month for ten years preceding.

With this upper wind were combined lower temperature, greater humidity, heavier pressure of the atmosphere, and more abundant rains than were recorded during the same ten years. When these conditions are taken in relation to the tropical current that sets along our shores, from the heated volume of which there has been a great evaporation over an unusually widespread surface, we can understand how the cool heavy air above, pressing upon the lighter moist strata below, may have produced unusual condensation, which, in the production of the rains, has caused those occasional heats which were so remarkable in the intervals of the more boisterous stormy gales which we have experienced. There has been a great disturbance of the ordinary electrical atmospheric *status* of the air; and, without taking into account any local or incidental occurrences, such as the influence of the telegraphic wires or the iron rails now stretching across the colonies, which must have affected in some degree the electric state of the atmospheric strata near the surface, or of the peculiar state of the sun, we may conclude that the present is a period when we are naturally incited to inquire whether we are living at the commencement, or middle, or end of a cycle, in the terrestrial and meteorological movements of nature. After an examination long ago of many thousands of phenomena, I came to the conclusion that at certain intervals, or multiples of them, nearly the same meteorological occurrences took place. I am informed by a close observer that the year 1819 [illegible] distinguished by just such a season as this—that [illegible]ediately after a great disruption of ice in the [illegible] regions which produced just such changes as [illegible]rienced here. Of course, we cannot [illegible]ok place in the Antarctic regions at [illegible] having observed that in this part of [illegible] occurrences are noted at about six months' [illegible]om the time of similar occurrences in the [illegible]n hemisphere, it is not without a show of reason [illegible] might conclude that the irregularities of 1819, which was a marked year in this hemisphere, may have nearly corresponded with those of the same years in the other hemisphere. And if so, this year, at an interval of fifty-one years (a multiple of 17), satisfies the period in question.

TREES FOR SHELTER AND MOISTURE.

NDER the heading, "Use of Wind Breaks," *Hearth and Home* recom- s that which we have often recom- ed in this magazine—a more liberal y of wood as shelter for stock. There any parts of this country, and particu- in the pastoral districts of Scotland, belts of trees would be of immense rtance for the health of both flocks and , more especially for sheep. There e no doubt that year after year many s of the "woolly people" succumb to ses which have been superinduced by sure that a screen of trees would save. me parts we notice these belts, and are, besides being a useful, a pleasing ect in the landscape. And they are able also, for the timber, if judiciously ed (and in the pastoral districts we of there is nothing better than Scotch ill yield a good return when thinned. her reason at the present time why trees d be planted, is that which is now being gly insisted upon by the general press— ne papers with calmness and knowledge, ers with some little passion and unwis- —viz., that the wood tends to draw earth- that moisture of which, for the last years, and more remarkably during the nt one, we have had such a scarcity. so many reasons in favour of shelter, we proprietors at home will act upon the e which *Hearth and Home* gives to owners in America.

s of trees—deciduous and evergreen—will break wind from a large tract of land, and render the local climate comparatively mild and equable. The effects of a screen of evergreens, particularly in breaking off the wind from houses and grounds, and in modifying the cold of winter, is far greater than one supposes who has had no experience in this matter. It is said by those who have made the experiment, that the expense of planting such trees about a house is soon covered by the saving of fuel occasioned by the shelter they afford. Such belts may not break off all the winds that blow, but they will soften their asperity, and apparently mitigate their coldness.

Experiments of this kind have been tried on seashores, and with success. A recent traveller speaks of a certain district in England, on the cliffs of the German Ocean, which had formerly been a bleak, sterile promontory, but is now a beautiful and productive garden. And this transformation was effected by building on the exposed sides, first a "strong, high fence of furze bundles or brushwood, and then planting inside of this a thick screen of trees." These trees consisted chiefly of the Norfolk black willow, Scotch elm, larch, and ash; and of evergreens, the *Pinus pinaster* and Scotch pine. These trees were fringed with such shrubs as the snowberry, alder, and berberry.

In visiting several fruit orchards near Cayuga Lake, last summer, we noticed that two of the very best were shielded on the north and west sides by screens of Norway spruce. A single row of these trees answered the purpose, and they were set out the same year that the orchards were planted. The American arbor-vitæ (the common white cedar) and the hemlock spruce would answer an excellent purpose as wind breaks, the only objection to the latter being the difficulty of transplanting it.

But enough has been said to illustrate the importance of shelter, and to suggest some of the means by which such protection may be secured. We need it at all seasons of the year, but especially in winter. We need it for the comfort and pleasantness of our homes, for the comfort and health of our labourers and of our domestic animals, and for the complete success of our attempts to cultivate well the earth.

"*DOWN BY THE WAVING WILLOWS.*"

THIS is a very popular song—a song of which it may almost be said, to use up an old joke, that it is in everybody's mouth "Once a-Week," "All the Year Round." Few people who sing it, however, are aware that the waving willows are as profitable as they are popular. Out of the willows, which grow by the sides of sluggish streams, are made baskets, and these, dexterously contrived, make a large profit to the workers. But, without the dexterous contrivance, there is in the willows themselves a large profit to those who grow them upon scientific principles. Many of our readers know that the cultivation of willows is a branch of husbandry which is taken great care of in some parts of the country, while in others, where scarcely any attention at all would be necessary, willows are left comparatively neglected. It is well known that the soil upon which they grow luxuriantly is but ill adapted for any other seed or plant, and that therefore the space which they fill up is utilizing waste ground. Why, then, should our enterprizing farmers, who have lands where cereals or roots will not yield them a proper return, not condescend to make use of them as a commodity which would at least pay the rent, with a profit upon the soil on which they grow?

There has been much discussion of late upon the reclamation of waste lands; why not reclaim a portion, without almost an[illegible] trouble [illegible] planting willows? We cannot [illegible] better [illegible] from a [illegible] [illegible] [illegible] nomenclature differs in al[illegible] [illegible] locality. That the best quality of willows must be grown rapidly is obvious; therefore *soil, climate, situation, management,* and *adaptation of the species to the purpose* must be the leading principles in their cultiv

Soil.—The genus salix, which is a very one, at present amounting to 233 describe besides numerous varieties, are, as may posed, found growing in almost every varie Those reputed species (for in the case of t who can say what are species and what a varieties?), adapted to the purpose we have in view, are found to succeed best in ri rather humid, soil—the alluvial deposits by of sluggish rivers, fens, the sites of pre-exis water lakes, and the margins of ditches Although most of them prefer a humid soil like to have their roots in a state of consta tion, and thrive best in land subject only sional flooding, as exemplified along the ba Thames from Reading upwards, where so best osier grounds in England are to be fou soils they dislike as much as they do a calca strong aluminous clay, or ferruginous gravel very poor moorlands they make little progr

Climate.—Rapidity of growth requires a climate; therefore, at altitudes much ab wheat will thoroughly ripen, their cultiva scarcely be attempted.

Situation.—Low, rather sheltered land banks of rivers or lakes, subject to occasi ings, but not of salt water, where they are against floating ice, which has often destro acres during a single flood, are the best. I good soil, even in moderate upland situat tially covered with water during a part of and dry at other times, formed into beds ditches between them, when they are foun remunerating cròp, if within a convenient demand. In all cases, they must be secur cattle.

On sloping banks, in steep ravines, whe 's good, they are found to succeed well. argins of inland lakes, where precarious c [illegible] inferior meadow hay is attempted to the ground be thrown up into ridges, exce rounds may be formed, where, while the escend in the water, the stems of the plan paratively dry.

nagement, &c.—All willows are pro ngs of various sizes. The salix alba is ceed better as a timber tree when shoots feet and about 2 inches in diameter are pl when cuttings of smaller size are used; t at that size to be put from 18 inches to 2 ground, and succeed better than when roo are employed.

The strongest portions—that is, the lower end of ie one-year-old wood—make the best cuttings, at bout 14 or 15 inches in length, two-thirds of which to be inserted in a perforation made in the ground y a dibbler, to prevent the bark being displaced. hey are set in the place at once where they are to tand, in rows from 18 inches to 3 feet apart, and rom 1 to 2 feet distant plant from plant, according o the habit of the species. Some osier growers preer shoots of two or three years' growth, cut into 2 eet lengths, and inserted 1 foot into the ground, etting them in rows 2½ feet distant, and the cuttings feet apart in the line, for the finer sorts ; and for the tronger growers 3 feet by 2 feet ; but we prefer cutings of one year's growth, and from 14 to 15 inches n length. Close planting tends to prevent the formaion of side branches ; and as they are to be cut anually, a greater distance apart would be unnecessary. They may be planted either in spring or in autumn ; but he spring is in general preferred. They attain their full trength the third year, and will continue to be yearly ut (if for baskets) for many years, providing the soil and ituation be favourable. If grown for hoops, the shoots equire to be from two to three years' growth, and herefore should not be cut four years after being lanted. November and March are the proper seasons or cutting, the latter to avoid the wounds being njured by frost, and the former the unnecessary loss f sap which rises early in the family.

In the formation of the osier grounds, far too little ttention has in general been paid both to the prearation of the ground and the adaptation of the roper kinds to the circumstances of the place or he purposes for which they are intended. It may e stated that the section known as Ornards are best dapted to wet ground ; and although an opinion s very prevalent that all willows should be so lanted, yet such is not the fact, as experience and ong observation teach us that the others prefer comparatively dryer soil of good staple—in fact, rich alluvial deposit, or light loamy soil dry at he bottom. The ground should be divided by pen ditches, 1 foot or 18 inches deep, into beds from 12 to 18 feet broad, and the cuttings inserted in rows. And where they are grown for the purpose of the basket-maker only, the ground should be kept clear of coarse-growing weeds, by running the hoe through between the rows two or three times during the summer. Where the crop is to be cut over at periods beyond two years, the ground may be cleaned at each period of cutting only.

Newly-formed osier grounds should be allowed two years' growth before cutting, that the plants may become established.

Marshall estimates osier beds as becoming profitable in from two to three years, coppices in fifteen or twenty, while an oak plantation may be a century before it reaches its most profitable condition.

In Gloucestershire, where osier grounds abound on the banks of the Severn, the grounds are let under lease to the basket-makers, who keep up the fences and take upon themselves the entire management during the term of lease ; and a somewhat similar arrangement is followed along the banks of the Thames.

Under ordinary circumstances, osier grounds will pay an annual rent of from £20 to £25 per acre, and the plants, if properly attended to, will last for thirty years ; often longer.

The osier grounds on the Holkham property, planted chiefly with *Salix viminalis ;* the second year after planting yielded a rental of £34, 17s. per acre, and on an average yielded £27, 10s. per acre for many years, being annually cut for the basket-makers.

The diseases natural to willows are few. Galls on the leaves are common, but we are not aware of any great injury arising from them. An atmospheric blight, occurring about the end of July and beginning of August, has occasioned some anxiety in some localities. The symptoms are a curling of the foliage near the top of the shoots, where a blank spot may be observed on the twig. Each spot covers a small portion of dead wood, which causes the rod to snap when bent at that point ; this, however, is more apparent in old plants becoming exhausted than in young or more vigorous ones.

FOOD SUPPLIES OF PARIS.

BREAD.

A SERIES of articles on the food supplies of Paris has been begun in the *Pall Mall Gazette*. The first is upon bread, of which, during the year 1867, the Parisians, numbering 1,825,274, consumed 263,520 tons — being at the rate of 328 lb. per head, or 14½ oz. per head per diem. This was exclusive of 81,299 kilogrammes calculated by the authorities to have been eaten by strangers attracted to the Paris Exhibition. About a hundredth part of the bread consumed in Paris comes from the provinces and the environs, and pays an octroi duty of ¼d. for every 5½ lb. The remainder is made within the fortifications, at the 1201 bakeries licensed by the Government, and is retailed at these establishments, and at 526 subordinate depots.

In Paris, the working classes, who, as a rule, eat far less meat than their London brethren, have an instinctive aversion from bread of an inferior quality; and the middle and lower classes eat for the most part precisely the same kind of bread. Some years ago an attempt was make to introduce among the poor of Paris bread manufactured at the municipal bakery, such as is supplied to the Paris hospitals and prisons, and depots for the sale of it were opened at all the markets. Although the bread cost about ¼d. per lb. less than ordinary bread, the scheme met with but slight success, only 2,085,971 kilogrammes of it being sold during the year 1867, against 295,716,908 kilogrammes of the better class of bread. With the exception of this municipal bread, there is only one price for household [illegible] over Paris. Five sous per lb. [illegible] ice at the Barrier. [illegible] chaussee d' [illegible] have [illegible] selves. The [illegible] white, that of the second dark, and that of the third an intermediate shade. [illegible] Paris bakers usually mix these flours together in proportions according to their fancy. Certain flours, the source of which is known, are more sought after than others, and find an immediate sale. These are the flours long known as of the four marks, each mark being that of some particular miller. Some years ago two others were added, which raised the number to six.

MEAT.

Paris is provisioned by eight wholesale and fifty-seven retail markets, one cattle market, and four slaughter-houses. At these seventy establishments there are no less than 30,000 people employed, who, so far as the duties they have to discharge there are concerned, are all under the authority of the prefecture of police.

The Paris markets receive their supplies from upwards of 6000 producers, the bulk of whom are represented by fifty-five facteurs or salesmen appointed by the prefect of police, who have to deposit a certain amount of caution money, and are responsible alike to consigners, buyers, and the authorities.

The Paris consumption of meat is considerable. During the year 1867 it amounted to 121,707,599 kilogrammes, or 115,460 tons of beef, mutton, and veal, and to 13,645,959 kilogrammes, or nearly 13,000 tons, of pork, giving a total of upwards of 135,000,000 kilogrammes, or about 128,400 tons, being at the rate of 158 lb. per head per annum, and 6 9-10th oz. per head per day on a population of 1,825,274 persons. 20,310,308 kilogrammes of the above quantity came as dead meat from the provinces; the remaining 15,000,000 kilogrammes were supplied by 2,477,745 head of live stock consigned to the various Paris markets. Of these, 314,253 were bullocks, cows, and bulls; 219,641 calves; [illegible],615 pigs; and 1,707,266 sheep. During the year 1869, the consumption of butchers' meat in Paris had risen to 146,359,932 kilogrammes, or upwards of 144,000 tons, which increased the [illegible] rate of consumption per head of the population to 7¾ oz. To this has to be added a [illegible] quantity of horseflesh, the demand for which, however, has latterly slightly fallen off. And yet with this large consumption of nearly ½ lb. per head per diem, meat is a comparative rarity among the working classes of Paris as compared with those of London.

ore important departments, such as Cal-
ievres, Sarthe, Seine-et-Oise, and Maine-
, send the most regular and largest
es. Paris, however, lays half Europe
ontribution for its supply of provisions.
the year 1868, Germany forwarded no
n 629,342 sheep; Italy, 1950 bullocks;
501 bullocks and 2604 sheep; Hungary,
sheep; the Tyrol, 2183 sheep; and
and, 1239 calves. Latterly, arrangements
en made for the transit of a portion of
ense herds that graze on the plains of
ia for the supply of the Paris markets.
rly, when the trade was restricted, only
hers' shops were permitted in all Paris.
ays there are upwards of three times
ber, namely, 1574, besides 268 stalls in
rent markets, and 847 pork butchers,
ether, 2689 establishments.

H, POULTRY, VEGETABLES, ETC.

s supplied with fish by railway from the
points of the French coast, and even
lgium, England, and other foreign
under contribution.

rival early in the morning at the Paris
entrales of the long pile of railway
den with salt-water fish, is the signal for
ng scene. The waggons are quickly
of their different loads, and the baskets,
ar the names of their owners, and of the
to whom they are consigned, are sorted
e porters and unpacked, the fish being
large flat baskets preparatory to being
l for sale by auction. Regard is, of
ad to the grouping fish of the same
ogether, and to making the lots as
possible equal in size. The "ver-
me sixteen in number, who perform
are, moreover, careful to display the
best advantage. When the sorting is
several lots are passed on to the criers,
hirty and forty of whom are employed,
e business it is to shout out a descrip-
ach lot as it is submitted to the as-
bidders, and to report the names of
s buyers to the salesman's clerk, who
belongs to the fair sex. Whenever
arkable specimen, such as a gigantic
a monster sturgeon, is about to be put
dding, men are sent round the pavilion
sales take place, to announce the fact at
their voices, which invariably has the
ringing together numerous competitors
ze.

nd salt-water fish are sold under the
a considerable proportion of the former being brought to market alive in large tanks filled with water, from which they are transferred to stone troughs, where a constant current is kept up to restore them to a brisk and lively condition. The sales of fish at the Halles are conducted as rapidly as possible, time in this case being really money, as every hour the day advances, the value of the commodity invariably decreases.

The oyster season in France extends from 1st of September to the end of April, and the price of the fish, which is invariable throughout the season, is always arranged beforehand between the dredgers and the agents of the Paris salesmen. In the same manner, the principal Paris restaurateurs fix a uniform price to be charged to their customers. In 1867, the salesmen paid 40 francs the thousand, or nearly 5d. the dozen; in 1868, the price advanced to 71 francs 90 centimes, or upwards of 8½d. per dozen. It is needless to say that, at the Paris restaurants, oysters were retailed at almost double that amount.

The quantity of salt-water fish that arrived at the Halles Centrales during the year 1867, amounted to 18,283 tons, which realized 16,441,000 francs, or £657,640. There were only 1626 tons of fresh-water fish, which produced 1,925,900 francs, or £77,036. In 1868, the quantity of salt-water fish had increased to 19,350 tons, still the returns were upwards of a million of francs less than they were the year preceding. The fresh-water fish mounted up to 1907½ tons, and produced nearly 200,000 francs beyond what it did the year before. Upwards of one-fifth of the salt-water fish came from abroad, principally from Belgium and England, while Holland, Prussia, Italy, and Switzerland supplied fully three-fifths of the fresh-water fish that was consigned to the Paris markets. During the year 1867, there were sent to the Halles Centrales 26,750,755 oysters, the larger portion of which came from the oyster beds of Coürseulles and Saint Waast. In 1868, the supply fell to 25,496,752, and, strange to say, among these the Ostend oysters, which are held in such high estimation by Parisian gourmets, presented the insignificant figure of 5350. It is true that a much more considerable quantity may have been forwarded to Paris, as beyond the oysters sent direct to the Halles, no less than 215 tons, together with some 64 tons of salt and fresh-water fish, entered the capital at the barrieres de l'octroi during the same year.

In 1867, the game and poultry forwarded to the Halles amounted to 14,650,000 head;

3,114,000 of these being ranked as game, which, in France, comprises such birds as larks, of which there were no less than 1,110,000. The partridges amounted to 540,000, the pheasants to 37,400, the snipes only to 30,000, in addition to which there were quails innumerable. The hares were some 270,000, and the deer 13,300. Twice or thrice every week, consignments of game, including blackcock, hazle-hens, and ptarmigans, arrive at the Halles Centrales from Russia, packed in oats, and stowed in baskets woven of pine-bark, such as ordinarily serve as cradles for Muscovite babies. About three-fourths of the poultry consists of fowls, ducks, and pigeons, the remaining fourth being composed of geese, turkeys, and tame rabbits. To the pigeons, which are invariably sent to market alive, the semblance of plumpness is imparted by women known as "gaveuses," each of whom has an assistant to hand the pigeons to her, one at a time, from the basket or coop in which they are confined, while she opens their beaks and ejects down their throats some soaked grain from her mouth. This operation, which is performed with extraordinary rapidity, is paid for at the rate of 3d. the dozen birds, each gaveuse being required to provide her own grain. The 14,650,000 head of game and poultry consigned to the Paris Halles in 1867, realized about 28,000,000 francs, or at the rate of almost a couple of francs per head all round. But beyond the foregoing, there were no less than 1100 tons of poultry and game that paid octroi duty at the city barriers during the same year, and never found its way into the markets at all.

An enormous quantity of butter, principally from Normandy and Brittany, is consigned to the Halles Centrales, every parcel of which is weighed, and marked with a particular number and its exact weight, by the market inspectors, before being submitted for sale. The name of the sender and the weight of his consignment are, moreover, indicated alike to the salesman entrusted to dispose of it to the agent of the octroi and to the chief inspector [illegible] market. I[illegible] 868, the quantity of butter [illegible] the Halles [illegible] [illegible] paid [illegible] [illegible]ably far [illegible] with regard to the general quality of its butter, and dealers having a wholesome dread of punishment, do not dare adulterate the article with all manner of filthy substances, but content themselves with mixing various kinds together, after duly subjecting them to immersion in lukewarm water.

The quantity of cheese of all descriptions forwarded to the Halles Centrales in the course of the year 1868, amounted to 3599 tons, and produced, according to M. Maxime du Camp, 2,454,612 francs, or at the rate of less than 3d. per lb. on the average, which is an evident error. Besides the foregoing, there was the cheese that paid the octroi at the various city barriers, and which amounted to upwards of 4000 tons.

The eggs consigned to the Paris Halles from the departments are forwarded there in large baskets, holding, on an average, about 1000 each; and, owing to the skilful way in which they are packed, they manage to arrive unbroken, spite of the shocks to which they are subjected during their transit by rail. No less than 229,000,000 of eggs reached the Halles in 1868, and realized 17,045,013 francs, or only a fraction under 9d. per dozen. They are, however, invariably sold by the hamper, and according to the number indicated by the sender; but people are specially employed to verify, not merely the contents of each basket, but the quality of the eggs as well. This duty is performed in a dark cellar by the aid of a single lighted candle, in front of which every egg is held to ascertain that it is in a perfectly wholesome condition. Those which are spotted or opaque, or are discerned to be stale by the vacant space at the broad end, are put on one side to be disposed of to manufacturers, who used them for gilding and other purposes, while such as are recognized to be in a putrid state are immediately destroyed. The high price that eggs now command in the Paris markets, is attributed to the immense exportation which goes on to England, thirty-two egg merchants sending thither no less than 52,000,000 of eggs annually.

We have no means of ascertaining the quantity of milk consumed in the French capital, but we gather from M. Camp's volume, that Paris is hardly better off as regards the purity of its milk than London itself.

Fruit and vegetables are the only commodities that remain to be alluded to. The sales of these at the Halles Centrales in the year 1868 realized 3,349,700 francs, or £132,788. We are unaware of the exact quantity of fruit and vegetables that paid octroi duty at the city barriers, all we know is that there were 6920 tons of grapes consumed in Paris, beyond those sold at the Halles.

Among the Tombs.

uoting once more from "Daniel's
ıral Sports," or rather the Supplement
we must lay aside on this occasion
m to be resurrectionists, in so far that,
ıemory serves us right, for it is a long
nce we read the paper, the list of
on angling in the article under that
ı the "Encyclopædia Britannica" is
to a great extent from the Supplement
'olumes from which we have been ex-
;, and without, so far as we have ob-
acknowledgment. As the Supplement,
r, is not a common book, it may doubt-
ve been thought that the plagiarism
never be observed. Perhaps, how-
is not a plagiarism at all, as our copy
aniel's Supplement" is dated 1813;
e never noticed the list in the older
; of the "Britannica." But whether
as we do not think the "Britannica"
ıe list so full, we give an extract con-
three antient books about the gentle

CATALOGUE OF BOOKS ON ANGLING.

: Lovers of the Amusement of Angling, the
; Account of the various publications upon
ct may not be unwelcome. Many of these,
Circumstance of the Editions being originally
umber, or from other accidental Causes, now
ge Prices.

second Edition of the Treatises of Hawking
ting, ascribed to Juliana Barnes,
ıegynnyth the Treatyse of Fysshynge with an
Fol. Lond. Wynk. de Worde. 1496.
'ynk. de Worde. 4to. Lond. W. Copland.
l. Joh. Waley. 4to. Lond. Wyllyam Powell.
d. Wyllyam Powell. 1550. 4to. Lond. Abr.
.d W. Copland. fol. Lond. 1810, reprinted
ıile from the Edit. of 1496.

a Berners, Barnes, or Bernes, the religious
nan, to whom the above tract is ascribed,
:o have been of a noble family, sister to
Lord Berners of Essex, and Prioress of Sop-
r St Albans. She flourished, according to
Pitts, about the year 1460; and is celebrated, by Leland, Holinshed, and other writers, for her uncommon learning and accomplishments.

Beside being the first printed Treatise on the subject in the English language, this work affords us rude representations of the different kinds of tackle now in use: and contains directions and remarks, which have been copied even in some of the most recent Treatises on Angling.

Of the quarto edition, printed by Copland, Herbert mentions two other copies: one, printed "in Lothbury, over against St Margarets Church;" the other, "in Seint Martyns parish in the Vinetre, apon the three Crane Wharfe."]

"Hawking, Hunting, Fouling, and *Fishing*, with the true Measures of Blowing, &c., now newly callected by W. G. Faukener." 4to. Lond. 1596.

[W. G. is William Gryndall]

Hawking, Hunting, and Fishing, with the true Measures of Blowing. Newly corrected and amanded, 1596." 4to. Lond. Edw. Alde. 1596.

"A Booke of Fishing with Hooke and Line, and of all other Instruments thereunto belonginge, made by L. M. 4to Lond. 1590 . . . . 4to Lond. 1596. . . . . 4to. Lond. 1600 . . 4to. Lond. 1606.

[This Treatise contains a few improvements on the directions of Juliana Barnes. It has woodcuts of the Pike and proche hocks, &c., with some remarks on the preservation of Fish in pools. L. M. is Leonard Mascall.]

A New Booke of Good Husbandry, very pleasuant, and of great profite both for gentlemen and yomen: conteining the Order and Maner of making of fishpondes, with the breeding, preseruing and multiplyinge of the Carpe, Tench, Pike, and Troute, and diuerse kindes of other Fresh-Fish, Written in Latine by Janus Dubrauius, and translated into English at the speciall request of George Churchey, fellow of Lions Inne, the 9 Februarie 1599." 4to Lond. 1599.

"Certain Experiments concerning Fish and Fruit practised by Iohn Taverner, Gentleman, and by him published for the benefit of others," 4to. London, printed for Wm. Ponsonby.

On the family of John Taverner, see Masters Hist. of C. C. C. Cambridge.

The next extract we make is from what we believe to be a very rare book, and one of the first, if not the very first, published about agriculture in Scotland. It is named "Husbandry Anatomized." The date of its publication is 1697, and it was dedicated to one who held the highest official position in Scotland, the "Earl of Maichmount," Viscount Polwarth. The Earl, it may also be presumed, must have taken an interest in agriculture, else Mr Donaldson would not have inscribed his book to him. It is worthy of note that nearly two centuries after the publication, Lord Polwarth is, at the present day, the most celebrated breeder of Border Leicester sheep in the kingdom. At present we give only the preface to the book, printed *verbatim et literatim.* It is an interesting biography of the author, and gives us some insight into the spelling and printing of the times.

To the Right Honourable Patrick Earl of Marchmount, Viscount of Polwarth Lord High Chancellour of Scotland and the whole remnant of His Majesties most Honourable Privy Council

Right Honourable

It may be looked upon as a Peice of heightned Arrogance, for such a person as I am, to presume to Endite anything that may deserve your Lordships Cognisance; and truly on any other Subject but this most Plain and Genuine Art of Husbandrie: I had scarce ventured, to publish my Sentiments and much less presumed to offer the same to such August Venerable and Judicious Criticks Who are acquainted with Learned and Eloquent Treatises on all Subjects: But where there is greatest Judgement, there useth to be most Discretion, Which gives me Confidence and Ground to hope that what I here offer with Respect and Good Will, allanarly with an Eye to the Publick Good shall find acceptance. Tho' from the Stile of Writing or Congruity of Language, no such thing can be pleaded for; Rhetorick being that which neither the Subject doth require, nor any simple Genus can aspire to.

Perhaps two Questions may be asked, Concerning my Experience in Husbandry, and Motives in publishing thereof. To give a positive and distinct answer to both will require an abridged History of my own Life which I shal [illegible] Brevity repeat because it [illegible] a kin[illegible] [illegible]owing Shee[illegible] [illegible] [illegible]ts and C[illegible] [illegible] heritab[illegible] [illegible]re as much know[illegible] [illegible]ctised in that place of th[illegible] Country. Some [illegible] years before the Revolution I applyed myself to the Study of Traffick and Merchandizing; But as soon as it pleased God to call his Majestie (the Prince of Orange) to relieve these Kingdoms from the imminent Danger they then stood in; I judged it my Honour and Duty to concur with such a Laudible and Glorious Undertaking: And according to my Ability, testified my Affection to the Cause, several wayes needless here to repeat, and especially in Leavying a Company of men for his Majesties Service, and served in the Earl of Angus his Regiment, till the second day of February 1690, when that Regiment was reduced from twenty to thirteen Companies.

I was disbanded, But through the scarcity of money in the Exchequer and great need of keeping an Army on Foot; Hitherto I have received no reimbursement of money I Depursed on that Occasion, nor what I can claim of Arriers: But the chief Cause of my being reduced to the present hard Condition I am in, was, The leaving my Business in Confusion when I engadged in His Majesties Service, not getting Goods in my Custodie disposed off to Advantage nor debts due to me sought in; And on the other hand my Creditors sued for what was owing them, I was obliged to satisfie, and pay several other sums I was Caution for to my great loss: By all which and several other misfortunat accidents, my Credit was much broken and Estate near Exhausted. Notwithstanding of all which, I wrastled under all these Disadvantages, still thinking to have recovered till within these two or three years. At length I was obliged to succumb, my Creditors attacking all my effects; I was necessitat to leave the Kingdom for a time and now returning empty handed I began to Reason thus with myself: What? Have I learned nothing from all that I have seen or heard whereby I can be Useful to myself or the Common Wealth. And at length came to this Resolve, I have had some Experience of the Way and Manner of Labouring the Ground in this Country; And I have seen their Way of mannaging thereof in some other Places which is generally done to greater Advantage: And when I began to try what might be the Causes, why there is such difference of Increase in one place more than another, I found it is not altogether from the difference of the Climate nor Primitive Constitution of the Earth.

And as soon as I thought of publishing this, I thought it my Duty (with all Humility) to present it to your Lordships in Respect you are not only Proprietors of a great part of Lands in this Kingdom, but also in Authority and Dignity, to recommend this Project both by Example and Precept; And if it may seem practicable in your Lordships Eyes and any Benefit come to the Publick thereby, I shall reckon it [illegible] special Mercy of God (who by his Overruling Providence oft times worketh that by contrary like means) that I am reduced to this penurious condition; For if it had pleased God to continue me in prosperity, I [illegible]ve this Project had never entered my thoughts. [illegible] not so self conceited, as to apprehend there is [illegible] great Mistery in what I have here published, for it is a thing many have not only known but practised; but never any that I yet saw hath published it in thir Terms for, (as it noted in Page 125) the grand Mistake s-calculation ; and I forsaw, if I had used method of writing on this Subject, it had ted the Profit would not overballance the For which Cause I have Chused to go ery Particular, and show how and from Profit doth arise.

Epistols Dedicatory are usually stuffed with of those to whom they are directed, But the ce were here supperfluous (though I were such a task) as the Poet who was desired to raise of Alexander, answered ; Who hath Alexander? So I think my dull Pen to applaud unquestioned Vertue were not but Injurious, Wherefore, I judge it my ence to be altogether silent and let you dge whither Real Vertue doth not dwell in of these whom Divine Providence hath such Dignity. And the most Serene, d Judicious Monarch this Day in the eth choice of for His Councellours. But to xity, and encroaching upon your Lordships I shall conclude. Now that all Honour, and Endless Felicity may always attend earnest wish and Unfeigned Prayer of Your most Humble and Obedient Servant

JA: DONALDSON.

—Page 8 Line 8 for Vigitables read Vege- several other places. Page 25 Line 12 for ead only add. Page 107 Line 1 for 5 read ne 3 for 200 read 1600. Page 108 Line 10 ad 7907.

y other literal errors incident to creep into throw mistake, be pleased to correct them And if it were proper here to make any for myself I might plead the more to be respect I have been so hastened to have d before the session fare down (and other dless here to repeat) that before I wrote the t the first was at the Press, and never after heet of Coppy ready at once the whole time nting.

he following extract from the Rev Dickson's "Agriculture," it will be that the

AGES OF DRILL AND HORSE-HOEING HUSBANDRY

gnized a century ago.

husbandry must be distinguished from the g. Every person that considers it, must it is an improvement. By the drill, the seed ually distributed than by the hand, and the dged proper is sown with greater exactness- is sown by the drill, it comes up in such a makes it easy to destroy the weeds that ith the corn. This operation, it is true, is but there is some reason to believe that, ct sowing, there is as much seed saved as will balance this expense. Besides, it is not easy to determine how great benefit may arise to the crop from having the weeds destroyed that come up along with it.

I mentioned the horse-hoeing husbandry likewise as an improvement, and it must certainly be allowed to be so. Mr Tull was the ingenious author of this scheme of husbandry, and it is probable, if he had not been so sanguine in recommending it, and condemning all other practices, that it would have made greater progress. His violent hatred at dung, a thing which was by no means necessary to the establishment of his scheme, and his attempt to shew that it is of very little use, was so contrary to the maxims which the farmers had imbibed, and which had been established by the practice and experience of all nations and ages, that those chiefly concerned would not give that attention to what he said in favours of horse-hoeing, that the importance of the subject required. Besides, there is nothing in the ordinary husbandry that requires such exactness in the execution, as the horse-hoeing husbandry requires, and this makes it difficult to get servants to attempt it with any degree of spirit. The principles upon which it is founded are just. There is not an intelligent farmer, that is not sensible from experience, that it is a great benefit to the crop, to have the weeds destroyed, to have the soil divided, and frequently exposed to the influence of the air. And there is no scheme of management so proper for answering these purposes as horse-hoeing, unless we would except the Roman husbandry, in which, as shall be shewn, the land was fallowed almost after every crop, and at the same time, the greatest care taken to hoe, and otherwise destroy the weeds while the crop was growing. If the principles upon which this scheme is founded are just, it is certainly worthy of a proper trial, though the first attempts may be attended with some difficulty. By perseverance, every difficulty will be surmounted, and the exactness which it requires in the execution will be at last attained.

It will appear to many people not only strange but inappropriate to return to one's old ideas again. It looks like as if you were worn out. This does not follow, for we have it on the best authority, that there "is nothing new under the sun," and the more one reads and considers, the more they must admit, however reluctantly it may be, that opinions and practices which they see set forth as new, are simply matters of history, dressed in scarcely a new garb. There are, no doubt, certain facts in science with which, so far as we are aware, the antient world was unacquainted, but there is presumption that these are but the development of speculations, crude, but still existent thousands of years ago. The steam-engine, of which James Watt is the modern father, was not unknown in antient times, not in the same form indeed, but the motive power was the same, although the manner in which it was applied was different. No one believes now that the world was sustained on the back of an elephant, although long ago it was stated that it was so. The idea existed that it was not an independent body, that it was sustained by something extraneous to itself; and an elephant being an emblem of strength, was chosen as its supporter. The germ of truth was here. But centuries elapsed before it was found out that it was the sun the earth depended upon for its position in the universe.

And coming to the cultivation of the soil, what do we find? Simply that instructions about how the land should be tilled and treated are very much what they were a century ago; very like those that are instilled into us to-day—the lecturers believing all the while that they are imparting unto the agriculturists of this country fresh knowledge.

This year being a very dry summer, there has been a great outcry for water, and much has been written about irrigation. Farmers have been urged to make themselves, to a great extent, independent of the seasons, by adopting artificial means of supplying moisture to their crops. Well, in 1762, there was a dry summer, and here is what was written by a North Hertfordshire farmer to the *Museum Rusticum*, in November 1763:—"On the benefit of watering land in dry summers," with the editors of the *Museum's* notes thereon. It will be noticed also that Mr Mechi's notions about the value of thin seeding are no novelty:—

ON THE BENEFIT OF WATERING LAND IN DRY SUMMERS.

[illegible] following method of agriculture [illegible] *Museum Rusticum*, a work [illegible] of farmers in general, [illegible] a field of 5 acres, [illegible] grass in the year 1762, which proved a remarkably dry one; many crops of new-sown grass failing through the excessive drought of the season.

[illegible] summer [illegible] the preceding year, to [illegible] seeds [illegible] might be produced in the former crop, which was wheat.* During the winter it was again ploughed, and twice more in the spring. It was intended to have given it another ploughing, before it was sowed, to reduce it to a very fine mould, which is always reckoned best for grass; but the rainy weather at this time prevented it, the soil being a strong clay, very retentive of wet for some time.

The land was made as level as possible, and then sowed with white oats, only 3 bushels on an acre, contrary to the maxim of this county, where our farmers never sow less than 4. This was designed with a view of preserving the grass seeds, consisting of *ryegrass*, *trefoil*, *white Dutch clover*, *rib or plantane grass*, and *hay seeds*, from being choked up by too great a crop of corn, which is often the case in wet seasons. The corn growing rank, is soon laid by the violence of the wind and rain, to the total destruction of the grass, none being observed to grow where the corn is laid.

The season proving remarkably dry, I took a very particular, and almost, I may say, a singular method of helping my crop to rise in spite of the dry weather, so prejudicial to the grass.

At all events, I fitted a trough, pierced with holes, to a water-cart, that contained 60 gallons, in the same manner as the streets in London are watered in the summer time; and a pond being contiguous to the field, my servant, with only one horse, watered the ground in five days' time, and that only once over, which answered beyond expectation, giving convincing proofs of the utility of the scheme.

In about a fortnight's time the grain arose to a considerable height, shading and keeping cool the grass underneath. By harvest time several of the oat straws measured from 4 to 5 feet in height; and the very next field, sowed with oats and grass, failed considerably, none of the oats measuring more than 2 feet, and many under. The crop of grass was entirely lost, and obliged to be ploughed up again in the following winter.

The produce of my field, so managed, was 32 quarters † and 2 bushels of good oats, and would have

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* Our correspondent's ploughing this field the preceding summer, to destroy the weeds that might have risen in the wheat stubble, was certainly very good husbandry, and could not fail answering his expectations. This ploughing was, besides, of great service towards reducing the land into a fine tilth.—*O.*

† This was, indeed, a very good crop, and we join with our correspondent in admitting a great efficacy in his watering. We should, however, have been glad if he had informed us at what time of the year he watered his field; how many turns of his cart it took to an acre, or, in other words, how many turns his man went in a day; in what manner the field was manured for the preceding crop of wheat; and whether that grain was sowed on a fallow, or after beans, peas, or any other crop. We should be glad of another letter from this gentleman, explaining these particulars; and his future favours, on any other occasion, will greatly oblige us.—*N.*

e, but I was obliged to make the stack in
t having barn-room at that time ; and the
age, afterwards to be threshed (the wind
m down the stack), contributed greatly to
e produce, or it had been larger.
ss proved very good, and a full crop.
ry other farmer lost their crops of grass
. I am convinced that watering the
ich was done in July, the grain being
April before, was the principal cause of so
duce.

not some of our modern teachers
ings in agriculture take a lesson in
m of tuition from the minister of
e Rev. Adam Dickson, who thus,
mildly remonstrated against the
thrusting things down people's
—

GENTLY WITH NOVELTIES.

ought surprising that this new scheme of
should be more favourably received in
ions than in this nation by Mr Tull's own
n. The editors of the third edition of Mr
tise have taken notice of this ; and, at the
have attacked the farmers as a parcel of
bstinate blockheads, who will not alter their
s, though, by following them, these gentle-
ey are unable to maintain themselves and
With all deference to the opinion of these
I think the bullying men in this manner
way to influence them ; on the contrary, it
vet, rather than remove, their prejudices. If
er how much the farmers have at stake, and
ite this new scheme is to the principles on
have been accustomed to act, we will not
d that they should be averse to engage in
f there is any blame in this, when inquired
ll be found probably to lie at another door.
e, if the greater regard paid by foreigners to
e can be accounted for, without having
the ignorance and obstinacy of the British
ne would rather choose that method as the
ming. This, I think, may be done, even
the scheme a very good one ; and this I
npt to do, not only as an apology for the
of those useful members of society, but also
e a means of discovering the value of the

laces in Europe where the greatest number
ents in this new scheme of husbandry have
, are in some parts of France and in the
f Geneva. Now, perhaps it may serve some
poses, besides being an apology for our
observe, that of late very great encourage-
e been given in France to agriculture ; that the persons who have tried these experiments are not farmers who rent land from others, but gentlemen who farm their own lands ; and particularly, that M. Lunen de Chateau-Vieux, who made the experiments in the environs of Geneva, is one of the principal persons, and has possessed the highest offices in that republic. But instead of insisting upon these, I need only observe that this new scheme of husbandry is much more consistent with the practices of those countries than with the schemes of agriculture established in Britain.

Mr Tull says that he took the first hint of this husbandry from the culture given to vineyards, and he calls his scheme an attempt to introduce the culture given to vineyards into the corn-fields. Now, persons who were accustomed to see a particular kind of culture given to the vine, would not be much surprised that an attempt should be made to give the same kind of culture to another crop, though very different. But there is another custom among these people, besides the culture of their vineyards, which disposed them to receive Mr Tull's scheme the more favourably.

In those places where the chief attention is given to vineyards, very little dung can be spared to the corn-fields. This is the case in many places in France, and was more so some years ago than it is now, as they have found it convenient, as I am informed, to turn many of their vineyards into corn-fields. This is the case in the environs of Geneva. M. de Chateau-Vieux, in one of his letters to M. du Hamel, says, that the corn land was seldom dunged, because the greatest part of the dung was applied to the vineyards. This made it necessary to fallow very frequently, so that in some places of France, and in the environs of Geneva, they follow, in part, the Roman husbandry, and have a crop of wheat and fallow alternately. Persons accustomed to raise crops by ploughing without any dung, and accustomed regularly to fallow as a preparation for every crop, might easily be prevailed upon to try the new husbandry ; which is still acting upon the same principles, and prosecuting the same plan of a fallow, and a crop alternately, though in a different manner. M. du Hamel argues in this very manner with the farmer.

I might add that the common labourers in Britain are much more independent of their masters, and have been taught to think and to speak more freely of them than in those countries ; and hence it is more difficult to get them to execute anything that is uncommon or troublesome.

These things mentioned may very well account for the more favourable reception that this scheme has met with in some countries abroad than in Britain, without having recourse to the obstinacy and stubbornness of our farmers. But there is another thing that may well be supposed to have more influence than any of them, and that is, the scanty crops raised in those countries upon the land which received the ordinary culture.

Agricultural Engineering.

THE USE OF PORTABLE ENGINES.

WITH reference to the comparative merits of fixed and portable steam engines, about which there is a good deal of difference of opinion, we confess to being in favour of the steam engine of a farm being a fixture in the farm buildings. This, of course, implies that, in designing a building, a special position with relation to the machinery which the engine is to drive, should be given to it.

One of the reasons why portable engines have been preferred to fixed ones, no doubt is, that on many farms the buildings are not adapted for fixed engines; another reason in favour of portable engines is, that they can be readily transferred from one part of the farm to the other; whereas all work must be carried to the stationary engine. As against the portable engine, it may be alleged that there is much risk of fire from the sparks, especially on a windy day.

Again, there is a mechanical incongruity in the working of a portable engine and a threshing machine, also portable in the sense of its not being provided, any more than the portable engine, with a fixed base upon which to work. Every mechanic knows how necessary to the doing of good work the steady working of machinery is. The two machines mentioned, however carefully set down, have not such a base, and therefore work unsteadily. [illegible] far as economy is concerned, [illegible] engine is preferable to a portable [illegible] quickly done, and [illegible] [illegible] unsteady [illegible] fixed [illegible] engine is [illegible] working of [illegible] than the threshing machine—such as the straw-cutter, corn mills, oil-cake breakers, turnip and root [illegible] pulpers, &c., &c., than a portable [illegible] while saying all this we do not by any means wish to ignore the fact that there are many instances in which the portable engines are the most convenient to be used, many in which they can alone be used, and that they have served an exceedingly useful purpose in farm economy.

With reference to portable engines, it may be remarked that, when not working, they are often badly kept. Not seldom have we been surprised to see a fine first-class portable engine, a delicate piece of machinery in every sense of the term, "laid up" in some out-of-the-way corner of the farm building, exposed to all weathers, often badly covered, or with no covering at all.

The injury which is thus done to an engine cannot be easily overstated; and the injury is all the greater if the engine has been put aside, as it often is, with its various parts uncleaned. And it should not be forgotten, that an engine, however carefully cleaned when set aside from work, receives no small amount of injury from the mere cessation of that work. An engine working daily, with proper attention, will last much longer than when it is allowed to stand still for a time, without any care being bestowed upon it. Cleanliness is no less essential to machinery than it is to the human body. See that the joints are well oiled, and the nuts screwed down properly, so that the bearings will be equal, and the split pins and the collars of all joints be in their place and in good order. Let all bright polished parts be carefully smeared over with a mixture of white lead and grease, which, although easily removed when required, will keep the parts from being rusted; and if the other parts usually painted have a fresh coat given them before the engine is laid up in ordinary, the better. A portable engine should be placed under a roof, and carefully covered with tarpaulin.

STEAM CULTURE AND CLEAN FARMING.

W. SMITH, of Bletchley, had a letter in the *Times* recently, shew- to grow good crops cheaply. Steam, , must be the principal agent in the of the farm, for "steam culture ean farming," but clean farming may seen where there is no steam em- but, then, the expense of cleanliness ses as the motive power is greater. , on his farm—the soil by no means st character, being a heavy clay land, s in a dreadful state of dirt when he pon it—can now make a good clean for wheat, at a cost of 6s. 8d. per d for the succeeding crop of beans, varies from 7s. to 10s., according to ances. While he can himself make ltivation so cheap and so profit- Smith complains that he cannot, anding all his iteration, make understand how to do so. Mr experience as to the difficulty of all in possession of steam cultivating s to work their land to the same e as he does himself, is not singular. much to be wondered at that there ifference, for the application of steam recisely under the same conditions ployment of horse-power. In the f the Committee on Steam Cultiva- blished in vol. iii. of the Second the *Journal* of the Royal Agricul- iety of England, we find the follow- this very point:—"Mr Kasy Cooper ng the visit of the Committee to him, en over many steam-cultivated farms erceiving any advantage, and I have r others, where I have seen as many es as I can shew myself. In a ny instances steam is not a profitable nt, not from any defect of power in al construction or outlay, but be- w take the advantage they should ht do from it; here, as elsewhere, only obtained when one combines business habits with a knowledge of scientific principles." This agrees with the experience of the Committee, who remark, that "it is the man, and not the apparatus, to which the results are mainly due."

Many anxious inquiries being still addressed to Mr Smith as to how best to apply steam-power to the cultivation of the soil, that gentleman believes that the best answer is to give a description of how he would cultivate a farm of 325 acres, 122 acres of which are in permanent grass; 56 arable upon a deep, cool gravel patched with burning soil; and 147 acres of red clay land. The latter portion of the farm is divided into 12 fields of about 12 acres each, fairly shaped for steam cultivation; but they are over-run with twitch; and the hedges and trees surrounding, and in the fields, are very objectionable, alike because they harbour the seeds of twitch and spoil the growth of the corn for three or four yards on either side. "Landlords," Mr Smith remarks, "must look to this. That is their part, for they must clear these nuisances out of the way of steam cultivation." There were thirteen horses employed in working this farm, but five will have been sold when the steam apparatus commences work. The sum to be realized for the animals is estimated at £100, not a very extravagant valuation. The price of the steamer is £446. Deducting the £100 for the horses, will bring its cost down to £336. The steam apparatus being obtained, this is how Mr Smith would proceed with the cultivation:—

> The mode of cropping on the gravel land has been roots, barley, clover, wheat, beans or peas, and wheat or oats. This cropping will be continued, and will work well under steam culture; and as the land is pretty clean, there will be no extra operation by steam-power needed to make it quite so. The mode of working will be this, this year:—A ridging of an oat stubble for roots after it has laid upon the ridge for a couple of months; a careful man will be sent along each ridge to take out every particle of twitch that

grew while the oats were growing; then a subsoiler will be drawn along each ridge by four horses to split them, and bring out any portion of twitch there may be covered in the middle of the ridges, which must then be picked up. In due time the land may be harrowed and seed drilled in, or it may be put into ridges by horses, or worked in any way the tenant may think fit. The cost of the combined ridging and subsoiling by steam-power and the splitting of ridges by horses will be 10s. per acre. For the next crop, barley, the tenant may smash it in the spring by steam, or work it by horses, just as he pleases. Clover will follow next, and will need no operation. Wheat will come next, and for that the land must be ploughed over by horses with the common plough, after which the land must be ridge-ploughed and subsoiled, then carefully looked over, as in the case for roots, and the splitting of the ridges must follow, and so must the second picking of twitch, as in the case for roots, and the land may be planted with either beans or peas in any way the tenant may think fit. The cost of seed-bed will be 10s. per acre. After the bean or pea crop is harvested, the land must be smashed by steam-power, and cross-cultivated by horses for wheat. The cost of seed-bed will be 6s. 8d. per acre. The average cost of seed-bed for the six years' cropping will not exceed 7s. 6d. per acre, and the land may always be kept clean. I would, as a rule, advise a small dressing of manure for the roots and beans, and 3 cwt. of superphosphate for the last crop of wheat, and if the roots are drawn off, a little superphosphate should go on for the barley crop. The cropping on the clay land has been half wheat and barley, and on the other half, beans, peas, clover, vetches, and roots, but the latter failed in 1868 and 1869. This year there is a plant, they having been sown early, but they are now mildewed and must be pulled at once. On this land I would, under steam-power, advise the cropping to be thus:—Beans or peas—If a bit of vetches is needed, the tenant may grow a bit, but I see no good in them. After the beans or peas, wheat should follow, and the next year barley should be the crop. For beans, the land should be manured with about 10 or 12 tons of common dung, which, in October, must be ridged in by the combined riders and subsoiler by steam-power, and the ridges must be split in December, and the same amount of twitch picking must be done as is pointed out for roots on the gravel land. The cost of this seed-bed will be 10s. per acre after the beans are harvested. The land must be smashed by steam-power, and then crossed by horses, after which the wheat must be drilled in 10 inches, from row to row; 3 cwt. of superphosphate should be given to the wheat crop per acre. The cost of seed-bed will be 6s. 8d. per acre. When the wheat comes off, the land should be ridged and subsoiled by steam-power, then hand-picked as for beans, then split by horses and picked again, after which, and at the proper time in the spring, it may be harrowed down and the barley drilled in. Six cwt. of superphosphate should be given to this crop. The cost of seed-bed will be 10s. per acre.

The average cost of seed-bed for the three years' cropping will be only 9s. per acre, and at that cost the land may be worked 10 inches to a foot deep, and kept clean for ever, and the crops will all be good ones.

This mode of cropping, although not universally applicable, recommended as it is by a man of experience, who has made profit by his practice, will furnish some guidance to those who employ steam in the cultivation of their lands.

The Farm.

THE WHEAT MIDGE—CECIDOMYIA TRITICI.

. contemporary, the *Agricultural azette*, of the 20th ult., has a few on the wheat flies generally, and on idomyia tritici—wheat midge, or r maggot in particular, the larva was, when studied by Kirby, Curtis, low, supposed to be the chief scourge heat crop, but is now supposed by r to have given place to a species of yx. With this last we are un- ed, our observations of wheat-de- larvæ being limited to the wheat got, and to the tritici, the history last we have carefully traced, and l all authorities throughout several d ascertained the following parti-

. tritici of Meigen, which was called itici by Linnæus and other early s, is a small yellowish coloured dge, which appears in more or less e in wheat fields, and by neglected es, just before and at the time that t is bursting into ear. Compared y other flies of similar size, they are t slow and feeble like in flight, incap- ontending with even slight breezes, equently only to be seen in fullest e during calm weather, resting on g ears, or flying among the tops of t plants, and that chiefly in dull but remaining during the day and vinds among the lower stems and When settled on the young ears in depositing their eggs, they may be ed so closely as to be examined by microscope, when they will be seen g their long ovipositor between the inner chaff scales, down to the ower, upon which they lay a cluster of minute transparent eggs. These, when highly magnified, appear in form and arrangement somewhat like the pips of a raspberry or bramble-berry.

When the eggs are thus deposited, the flowers make no further progress, but the anthers remain fixed, until, with the embryo grain or germ, and other parts of the flower, they, in eight or nine days, become food for the larvæ, which are of a light watery colour at first, but change to orange yellow as they attain to full size. When the period for their assuming the pupa or chrysalis form approaches, they crawl out of their chaff-enclosed nest to the surface of the ear, and lose no time in springing from thence, in cheese-jumper like manner, to the earth, into which they burrow about half-an-inch deep, and undergo their transformation to pupæ, becoming stiffer and smoother, and assuming a deeper yellow or orange colour than the larvæ. In this stage they remain, and, when abundant, may be easily seen among the soil throughout the succeeding autumn, winter, and spring, till the time of wheat earing again arrives, when they emerge as flies to reproduce their kind, that perpetrate similar destruction of grain, as was done by their preceding generations.

When coiled or clustered up, often from a dozen to a dozen and a-half together, in their chaff-surrounded cells, they seem to enjoy a life of peace and plenty, but no sooner do they emerge, to take their fore-mentioned earthward leap, than they are liable to be pounced upon by small black midge-like flies, the Ichneumon tipulæ, of Kirby, that then frequent the wheat ears, on the look out for their prey. When one of these discover a maggot emerging, it is instantly attacked.

the black enemy getting upon it, piercing through its skin, and inserting an egg of its own, the pain of which operation is evinced by a wriggle of the grub, and the fly goes off in search of another subject to operate upon; and from being the pupæ of a wheat midge, it becomes a protecting case and food reservoir for the grub of the ichneumon, which devours its substance without changing the appearance of the outer shell, and instead of a yellow wheat midge appearing at the proper time, the black intruder issues forth about a fortnight or three weeks later. So intent are these minute black flies on egg depositing, that, if shaken on to the hand among a number of the wheat midge larvæ, they are easily seen, by a pocket microscope, marching about and depositing only one egg in each maggot, and avoiding every one in which an egg has been previously inserted. This small ichneumon is, no doubt, the principal check for keeping the wheat grain-destroying cecidomyia within something like moderate bounds; and when about half a century ago the wheat maggot became so destructive as in many districts to destroy fully a-third of the grain, it was noticed that they were restricted within usual numbers after a season in which the black flies were unprecedentedly numerous. Dry, stirring weather, during the short period of their winged existence, by preventing them from settling on the young wheat ears, also aids materially in keeping them under. The uncommonly rapid advance of the wheat to maturity in the present season, has tended to aid in the same direction, much of it being cut and stacked before the larvæ were sufficiently advanced to allow of their scaping into the soil, where they doubtless bernate most successfully. For although eir pupæ may remain safe in or among the threshed ears and straw, the ordinary barn ressing operations are sufficient to separate hem from the grain; and even should they e conveyed among the chaff or straw to he dung yard, they will there be liable o various contingencies arising from manure heating, its unseasonable application to the land, &c., which will either destroy the vitality of the cocoons, or bring their inmates into active breeding existence at harmless periods. For although the natural temperature of the fields brings them forth simultaneously with the wheat ears, they are easily forced or retarded by being kept in warmer or colder mediums. Thus, if the cocoons are placed in an ordinary hot-bed early in March, the flies will appear from two to three weeks earlier than in the open air; and if retained in a cold northern exposure, they will not appear till the wheat crop is beyond being injured by them.

Some affirm that they have observed the wheat ear maggot in the florets of other cereal grains, as well as in those of many common grasses. An experience, however, of over forty years shews such affirmation to be unfounded. For although fully as frequent in the ears of the common couch grass as in the wheat, we have failed to discover a single wheat maggot in any other. Linnæus placed this grass among the triticums, or wheat, although modern botanists have transferred it to the genus Agropyrum. And it is somewhat remarkable that the wheat midge should, by laying its eggs in this most troublesome of grass weeds, seem to ignore the opinions of modern botanists, and to hold to that of their great teacher.

In the article of our contemporary, it is curious to remark how little knowledge which the eminent entomologists named possessed, regarding the natural history of this crop-destroying midge, and had its author turned to Loudon's *Magazine of Natural History*, for 1829, and various agricultural publications of that period, he would have got much fuller, as well as more reliable information from the writings of practical observers. And although Curtis, in his "Farm Insects," gives very good illustrations and descriptions, even that does not contain the full particulars presently known in regard to the Tipula, or, as it is now called, Cecidomyia tritici.

MR SHIRRIFF ON CEREALS IN EAST LOTHIAN.

R PATRICK SHIRRIFF, of Haddington, who is acknowledgedly one best scientific judges of grain and the ies thereof in this country, has written a ccount to a local paper (the *Hadding-re Courier*) about the improvement of s in East Lothian. Commencing half-n years before the beginning of the y, he traces the history of the progress cultivation of cereals down to the tion of the Salton Farming Society in which, in 1820, became the United othian Agricultural Society—the name, er, being taken under the condition he summer show should be held at , an out-of-the-way village.

794 (says Mr Shirriff) we learn that Sir George had raised from "three ears of particular " a variety of barley, which was known by ne, and also that Sir David Kinloch, of Gil-, had lately got from Switzerland a species of with six rows in the ear. These early attempts ovement were creditable to the men as indi-, but were productive of little advantage to the nity. We also learn from the same author, as from contemporary writers on agriculture, latterly the red oat had been introduced by at Upper Keith, and several others in the rts of the county." It is not anywhere stated s variety was discovered by Mr Brodie; but erally admitted that the chief merit of intro-it into the county lay with him, and oral tradi-as handed down that Mr Brodie raised l oat from seed picked over a table by his rs—an example deserving imitation at the time. Mr G. Buchan Hepburn enume-e varieties then cultivated in East-Lothian, he common, the Blainslie, and the Dutch, ng the red oat of Upper Keith as having sh shade when ripening, and quite so apt to s the Dutch oat, and, though not so early, was than the other kinds. There is no account of covery and raising of the red oat of Upper neither is it known to have been extensively t any time in East-Lothian. It is, however, that the name has seldom been heard after the art of the present century, and may be said to altogether forgotten. Some considerable time made the attempt to trace out the red oat of Upper Keith, but all the samples under this name obtained from the best sources produced grain undistinguishable from the sandy oat of the present day. A second attempt shewed the same result; but hopes are entertained that the third, which is being made this season, may go far to settle the point. In the meantime, it may be mentioned that the sandy oat is said to have been discovered in 1824 or 1825, on the farm of Milltown, of North Aberdeenshire. When alluding to the different kinds of wheat, Mr Buchan Hepburn says "the seed most in repute at present is called velvet wheat," known now as woolly ear, and said to have been raised from a few ears by Mr Mackie, tenant at Ormiston. There are several varieties of wheat with velvet or woolly chaff, and there is little reason to doubt that Mr Mackie's velvet wheat is the same as the close-cut, short-strawed woolly ear of the present day, and known centuries ago. Mr Brown, the well-known author of "Rural Affairs," writing on this subject in 1805, stated that Mr Mackie's velvet wheat yielded a goodly return in dry seasons, but in wet it suffered severely from mildew. In 1799, the loss sustained by those who sowed this wheat was immense. Then, in 1805, some farmers lost greatly by foggy weather coming on while the grain was filling. Since then it has gradually disappeared. Mr Brown also states that a variety of red wheat, originally of an excellent kind, "was selected by the same gentleman about ten years ago," but being liable to the same defect which attended the velvet or woolly white, it is now also given up. Mr William Mackie, Ormiston, seems entitled to be considered the first person who seriously attempted to improve the cereals of East-Lothian. The next cereal which came into note was the well-known Hunter's wheat. It is still pretty extensively grown in this county. This kind is known to have been introduced by Mr William Hunter, farmer, Knowes, Prestonkirk, but we have been unable to find any account by him of the discovery and propagation of this variety. We are told by this neighbour, the author of "Rural Affairs," that while riding over Coldingham Moor, then a poor ill-farmed district in Berwickshire, Mr Hunter plucked from a fine field of wheat a handful of ears, which formed the origin of his wheat. The plucking of a handful of ears while on horseback did not shew anxiety for purity of sample, and all along Hunter's variety has been a mixture of sorts.

The leading object of the United Society, according to Mr Shirriff, was the improvement of seeds; but it did not, from his own account, treat him very well, notwit ing that he himself was a director. Here are his words :—

The society having for many years liberally given premiums for samples of seed grain, which were required to be pitched in bulk for inspection of judges, great exertions were made to prepare grain for inspection by repeated dressings in the ordinary fashion, supplemented by picking out seeds of weeds by hand over white plates, and by running the grain over rough woollen cloth. We contended that such kind of preparation had no beneficial effects beyond removing the seeds of weeds, and the cereals which were mixed could not be rendered genuine, or materially altered by such means—that there was much resemblance between an egg and a grain of wheat, both containing a germ of life which requires for development certain conditions of heat, air and moisture ; and that a pure breed of fowls might as reasonably be expected from a basket of promiscuous eggs of dunghill fowls as a genuine crop from seed taken from the bin of an ordinary farmer. The first cereal brought under the notice of the United East-Lothian Agricultural Society was the Hopetoun oat, which attracted our attention by its height when growing on the farm of Mungoswells, in the parish of Haddington, in 1824. At this period the oats generally grown in this country were the Blainslie, or common oat, the potato, and the late and early Angus. The opinion then prevailed that the properties of short straw and early ripening were united in the oat tribe, but this fallacy was dispelled by the long-strawed Hopetoun oat, which soon spread over a considerable portion of Europe as well as of America. And in modern times, no cereal was so favourably received throughout East Lothian at first introduction, and it still occupies a place in the society's premium list. Application was made with this oat for the society's premium of £5, given for new varieties of seed corn ; but for years the secretaries treated the applicant and his oat with studied contempt. At length, however, at a general meeting of the society, it was moved and carried, that the correspondence relative to obtaining the premium with the Hopetoun oat be laid before a committee, to report to the next meeting whether the Hopetoun was entitled to the society's premium for new plants. A report on such a subject could hardly have failed to expose the members of the cave, who managed to settle the matter by the following minute of a general meeting of the society—"That upon re-consideration of the minute agreed to at the last meeting of the society, as to the correspondence relative to the Hopetoun oat, the society are now of opinion that the appointment of the committee was unnecessary, inasmuch as the chief reasons for the culture of the Hopetoun oat having now been fully established by three years' experience, and its superiority acknowledged, the society do not require any further investigation to induce them to award the premium to Mr Shirriff as
the original introducer of this variety of g
county. The meeting therefore recall
ment of the committee made at the la
the society, and hereby award Mr Shirriff
for the introduction of new plants, in t
annual list of premiums offered by the So
members of the cave had long plotted o
from the society, and the time of urgin
of the Hopetoun oat to a premium wa
carrying the plan into execution. It was
all the county that the Christmas anniv
society was fixed for the day of trial, an
so unusual a proceeding, the council-ro
dington, where the meeting was held,
from floor to ceiling with the aristoc
county, and many of the inhabitants of
who were ever afterwards excluded from
meetings. Some of the discussions were
the result was altogether disappointing
The conspirators were baffled, and the
Hopetoun oat saved from expulsion.
meeting was in the act of dispersing, the
cave made use of libellous expressic
our character, and in little more th
afterwards he set out by coach f
Before reaching the end of his j
while his fellow-passengers were refre
selves, he wrote to a mutual friend in
who is still alive, to endeavour to save h
consequences of his evil speaking ; and
the negotiation, we received, in writing, a
for having uttered such language, with a
be used in any way we thought proper.
was at once to have made the document
public ; still, witholding its publication
of bridling the tongue of the salaried s
leading to his resignation of office. The
its mouthpiece, while retaining its s
next new cereal brought under the
Lothian Agricultural Society's notice
wells' wheat, which sprung from a single p
for its vigorous growth on the farm
wells, in the spring of 1819. The plant,
carefully raised, produced at harvest
ears, which yielded 2473 grains, from w
was soon raised and sold to the public.
minister of Dunbar, got from us seed o
to sow his glebe, and the succeeding c
data for the large damages that the North
way Company afterwards paid for the gle
was carried to Oxwellmains, and the gra
the whole wheat brake of that fine farm
with a portion of the produce. In t
autumn, the Mungoswells' wheat of t
found to be particularly fine in quali
being purchased at the markets of Dun
dington, was resold in Mid-Lothian
wheat. In this manner Mungoswells'
tained many names, and it afterwards
spicuous in carrying out our scheme f

eals, as will be seen in the sequel. The first
our scheme was adopted by the society, and
ed to members in the following terms: "1st,
e most satisfactory experiment in growing on
soil, not less than three varieties of white and
ss wheat, £10, 10s.; 2d, do., do., on light
10, 10s. *Note.*—Intention to compete for
g wheat to be lodged with the secretary in
by the 10th of October. Wheat to be sown
8th of November, and inspected by indi-
appointed by the society in the beginning of
ber and April, when the crop is coming into
d when reaching maturity. Inspectors to re-
pearance of the crop at each visitation, with
to the numbers of plants in the ground, the
eristics of the varieties with regard to colour,
, leaf, straw, ear, and time of ripening.
titors to report to the society date of sowing,
and ripening of the varieties, with the products
in grain and straw, and any other circum-
attending the experiments deserving of notice.
ariety of wheat to occupy not less than one
ground." Two individuals competed for the
ms, namely, George Hope, Fentonbarns, and
Patrick Shirriff, Mungoswells—the judges or in
tors of the crops being Mr James Tod, Castlen
and Mr Francis Shirriff, Muirton. Reports were
to the society by the different parties connected
the experiments—all the conditions being fully ca
out. The judges concluded their report as
lows:—

"In conclusion, gentlemen, after a minute exa
tion of both experiments, which we hope the
report will testify, we, without hesitation, state
we are highly pleased with both trials, and re
mend both experimenters as well deserving the
thanks of the society, and give it as our candid op
that each is equally entitled to whatever premi
society may think fit to bestow." Both compe
were rewarded with the full premium, and the
bers were generally well pleased with the mann
which the experiment had been conducted from
to last. But competitive trials of this kind must
brace a series of years to be of much value, an
fortunately this premium was not again compete
—the most noteworthy feature of the experi
being the small difference between Hunter's
Mungoswells' wheat.

ADDITION TO OUR FOOD SUPPLIES.

A NEW source of food is advocated by Mr Andrew Murray, of the Entomological Department, in an Appendix to the Annual Report of the Science and Art Department of the South Kensington Museum. Mr Murray has discovered that there are beautiful fresh fish in St Petersburgh, they being brought alive every morning to the fishmongers. Aquariums even, we are told, are provided for them, until such time as they are wanted for the fish-pan. These fish are called sterlets, and are rightly, says Mr Murray—who seems to have partaken of them at the Horticultural Congress at the Russian capital—esteemed a great delicacy. It is, we quote a summary description from the *Pall Mall Gazette*, "about the size of a middle-sized pike, is a mud fish like the eel, and tastes something like it, but is more delicate in flavour, and not so oily. The consistency of the flesh is like that of the thin parts of the belly of the salmon, but white. It has no bones, or rather the bones are gelatinous, like those of other cartilaginous fishes."

A fishing vessel, Mr Murray thinks, could easily bring over to this country several thousands in its well, to be turned loose wherever wished; and their introduction by spawn would be still easier, as they spawn in winter time. From a note to Mr Murray's Report we learn that, "with a view of giving this experimen [illegible] rial, the Duke of Suther [illegible] his disposal two large [illegible] and the Minister of [illegible] undertaken to suppl [illegible] would not object to the Serpentin stocked with sterlets, or, indeed, wi geon, which Mr Murray is of opinio also be introduced here with ad Something of the kind is sadly wa make fishing in the Serpentine an exh and lucrative occupation."

Unfortunately, however, the pro Mr Murray, though a good one, comes at an appropriate time, as we well get rid of, at a profitable price, we are catching on our own coas have enough, and more than enough spare; so many, indeed, that in some forgetful of many poor, who would b ful for them, our fishermen, probably consent of the curers, are casting b finny tribe into the deeps from whe were drawn, or using them for pur manure in the advancing autumn or i The latter, certainly the better cours lacks that "one touch of charity whic the whole world kin." It is wastefu vidential mercies, and a practice although it may be commercially al has about it a tinge of immorality.

But notwithstanding the plethora which exists at present, and the stag trade in them, which an uncalled-for caused, we are thankful to Mr Murra suggestion as to how he can supplem food supplies.

Scarcity of fish may come, as it h done before; and peace, we trust, r n our time, but speedily; and t Murray's idea, if practicable, and [illegible] will prove a boon to this countr

THE WHEAT CROP OF 1870.

following interesting and instructive nmunication has been furnished by Mr wes, of Rothamstead:—

gh the climate of Great Britain is pro- changeable, our seasons are seldom rized by great extremes, either of cold : or heat in summer, while the amount ribution of rainfall are generally suited siderable variety of crops. Not more or three times in a century do seasons rkable winter cold, summer heat, or occur. Two years ago (August 1868), attention to the fact that we must go about half a century to find a season rized by dryness and high temperature ıme extent as the one then just past. sent season has been remarkable for dryness, commencing one month earlier vailing later than in 1868, while the ure has also frequently been very high. ıout the southern and eastern parts of , scarcely any rain fell during April, ıd June. There was rather more, but much less than the average in July, h of that which did fall was in heavy e or less partial storms; while August, as been, up to this time, extremely dry. on has therefore been in a great lependent upon the moisture retained he soil from the supplies of the winter ly spring; and the amount of this re- nust obviously have been very variable, ıg to the character of the soil and subsoil. ught very similar in character occurred . In that year, as in the present, the of grass-land was exceedingly small, crop was in many cases left uncut, its eing considered insufficient to pay the making into hay. It was, too, in 1844 first experimental wheat crop was taken e field on this farm, which has been to the growth of wheat every year from e to the present; and as the characters first and the twenty-seventh seasons e each other pretty closely, a comparison rst and twenty-seventh crops will be of ıterest. In the first season, 1844, the of wheat without manure was 15 bushels . In 1870, the twenty-seventh season ıt in succession on the same land, the unmanured produce is again exactly 15 bushels. In 1844, the highest produce by mineral manures, without ammonia, was scarcely 17 bushels, and in 1870 about 18½ bushels. In 1844, the addition to the mineral manures of 81 lb. per acre of sulphate of ammonia increased the produce to 24¼ bushels. In 1870, the addition of salts of ammonia, in quantities of 100, 200, 400, and 600 lb. per acre, gave, respectively, 26, 30½, 40½, and 45¼ bushels. When it is considered that between these two periods twenty-five crops of wheat have been carried off the land, the identity of the produce without manure in the two cases, and the general similarity of effect with different descriptions of artificial manure, is very striking.

The following table shews the amount and quality of the wheat yielded in 1870, the twenty-seventh crop in succession; the results being those obtained from the same plots, and under the same conditions of manuring year after year, as have been selected for illustration in previous years, and, for comparison, there are given by their side those recorded on former occasions, and also the average results for a period of eighteen years.

			Artificial Manure.				
Harvests.	Without Manure. Plot 3.	Farm-yard Manure. Plot 2.	Plot 7.	Plot 8.	Plot 9.	Means of Plots 7, 8 and 9.	Means of Plots 3, 2, & 7, 8, & 9.
			Bushels of Dressed Corn per acre.				
1863	17¼	44	53⅝	55⅝	55½	54⅞	38¾
1864	16½	40	45¾	49⅞	51	49	35⅛
1865	13¼	37⅛	40¼	43⅝	44	42⅝	31
1866	12⅛	32⅝	30	32⅛	32½	31½	25½
1867	8⅞	27½	22¼	30½	29⅛	27¼	21¼
1868	16⅝	41¾	39⅞	46½	47¾	44¾	34⅜
1869	14¼	38¼	28½	34¾	39	34⅛	28⅞
1870	15	36½	40½	45¼	45½	43¾	31¾
			Average of 18 years:—				
1852-1869	14⅞	35⅝	35¾	38½	36½	36⅞	29⅛
			Weight per Bushel of Dressed Corn (lb.)				
1863	62.7	63.1	62.5	62.3	62.1	62.3	62.7
1864	62.0	62.5	63.1	63.5	62.6	63.1	62.5
1865	60.6	61.5	61.6	61.4	61.1	61.4	61.2
1866	61.3	61.7	61.0	60.1	60.6	60.6	61.2
1867	56.1	61.4	61.0	60.7	59.9	60.5	59.4
1868	61.0	61.6	61.1	62.0	61.1	61.4	61.3
1869	56.1	56.9	57.4	57.2	57.1	57.2	56.8
1870	61.7	63.4	63.3	63.7	62.7	63.2	62.8
			Average of 18 years:—				
1862-1869	57.5	59.9	59.2	58.8	58.2	58.7	58.7

Thus, the permanently unmanured plot gives 15 and the farm-yard manure plot 36½ bushels per acre, or, respectively, slightly over the average of the eighteen preceding years. The three artificially manured plots give, on the other hand, very much over the average; plot 7 yielding 40½, plot 8, 45¼, and plot 9, 45½ bushels per acre; or, respectively, 4¾, 6¾, and 9 bushels over the average of the previous eighteen years. It is evident, that so far as wheat is concerned, the past season has been very favourable for the action of certain artificial manures, but much less so for farm-yard manure. A somewhat similar result was obtained in the case of the hay crop also, certain artificial manures having yielded more than 2½ tons, while dung gave not more than half a ton.

The quality of the grain this year is very high, averaging 6 lb. per bushel more than that from the same plots last year, and 4 lb. per bushel more than the average of the preceding eighteen years. In fact, this experimental field has not yielded grain of so high a weight per bushel since 1849.

Taking, as in former years, the average of plot 3, plot 2, and plots 7, 8, and 9 taken as one, the average produce this year is 31¾ bushels, or 2½ bushels more than the average of the last eighteen years. But as the average weight per bushel is this year 62¾ lb., or 4 lb. more than the average of the eighteen years, the 31¾ bushels are equivalent to 32¾ of the standard weight of 61 lb. per bushel, and to nearly 4¾ bushels more than the average produce of the preceding eighteen years, if the latter be calculated to the same standard weight per bushel.

The following are results obtained this year in fields which are not under experiment, but cultivated according to the ordinary practice of the farm, and, for comparison, with the new results, those recorded in former years are here repeated.

[illegible]

68.......4[illegible]

.869 [illegible]

[illegible]

Weight per Bushel of Dressed Corn.

	lb.	lb.	lb.	lb.	l
1863.......	63⅛	—	—	—	-
1865.......	59½	60	58	58	-
1866.......	60¾	60½	60⅝	—	-
1867.......	57	61½	60½	—	-
1868.......	64	61¼	61⅛	63⅜	-
1869.......	59¼	58⅛	59½	59⅜	59
1870.......	62¼	63¾	63	62⅝	-

It should be mentioned that the yie and 44½ bushels were both obtainec same field, the smaller produce being d of plant, so much complained of ov wheat-growing districts this year.

In another field, the whole of which formly manured, thirteen different descri wheat were sown, and the average resul lots already threshed is 48¾ bushels and more than 65¼ lb. per bushel, the one description reaching very nearly 67

The above records afford evidence superior crop of wheat this year under fa conditions, and also of considerable f under unfavourable conditions. Indee deavouring to form an estimate of the p the country at large, based on the res given, we must not lose sight of the fac plant has this season been unusully more especially on the lighter soils. wheat is concerned, there has been a seed forming and maturing season, but many cases upon an insufficient amount and it is probable that some of the hea some of the lightest crops ever known land have been grown this year.

Under the circumstances described, course extremely difficult to form a sat estimate of the average yield over th Kingdom. Considering, however, that wheat lands have suffered the least, that them have yielded large crops, and quality at any rate is generally con over the average, I think the crop of th Kingdom may be estimated as equi from 30 to 31 bushels per acre, weighi per bushel.

Taking, for safety's sake, the lower estimates as the basis of further calc [illegible] assuming, in the absence of th [illegible] the area under wheat to be s [illegible] in 1869, but equal to that [illegible], [illegible] acres, the gross produ United Kingdom will amount to 14¾ [illegible] Deducting from this 2¼ bushels for seed, there will remain available consumption as food 12 2-3d million quart the average population during the next months at 31 millions, and the require- per head to be 5½ bushels, the total ement will be 21 1-3d million quarters, g about 7 2-3d million quarters to be sup- from foreign sources. Last year, following ilar method of calculation, I estimated that ss than 9¾ million quarters of wheat would ıported during the harvest year ending st 31, 1870. The quantities of wheat and t flour, reckoned as wheat, actually imported September 1, 1869, to August 13, 1870, nted to about 9¾ million quarters, and ning the recent rate of import to continue end of the month, the total imports for ırvest year will probably exceed 10 millions. dy of the tables of imports for past years wever, sufficient to shew that estimates so are liable to certain special sources of error, ı are more liable to lead to under than to over-statement. Thus, it is obvious that over and above the quantities of wheat imported to complete the supply required to meet the average demand for human food, we sometimes receive a considerable surplus, dependent on the amounts which foreign growers have to dispose of. For example, the home crop of 1867 was an extremely bad one, and that of 1868 one of great abundance; and yet the imports for the harvest year following the abundant crop were only three-quarters, or a million quarters less than those for the year following the preceding very bad one. It is probable that when wheat is very abundant, and the price low, there is both an increased consumption of bread and a considerable quantity of wheat used as food for stock. I will only add, in conclusion, that, with a great European war proceeding, it seems of little use to hazard any estimate as to the probable range of prices up to the next harvest.

WOOD ASHES IN AGRICULTURE.

MUCH has been said of late years of the virtues of ashes, says the *Albany Country Gentleman*, for farming purposes, but we are confident the half has not been told. Our experience with them extends back a-quarter of a century, and every year's experience has strengthened our conviction that ashes are the cheapest fertilizer we can purchase. We formerly paid 10 cents a bushel for them, and though the price has doubled, we are satisfied that the commercial is still below the intrinsic value. We have tried lime and plaster, and on some soils and some crops found them useful, and on other soils and crops we have lost our money and labour in the use of these mineral manures; but ashes have never failed to pay well on all soils and all crops. Of course they do better on sandy and loamy soils than on clay, as the latter, being formed chiefly of granite rocks, naturally contains more potash, but there are few, if any, long cultivated fields from which the inorganic matter is not so far exhausted that ashes will not prove beneficial. This condition is the result of our experience. Now let us consider briefly the teachings of science on this point.

If we burn any vegetable or seed, we find the greater part goes into the air, but a small portion, varying from 1 to 12 per cent., remains behind in the form of ash. Thus, the grains of wheat burned leave 1.18 per cent. ash; oats, 2.58; potatoes, 2.65; carrots, 5.09; turnips, 7.05; wheat straw, 3.51; oat straw, 5.74; red clover, dried, 7.48; carrot leaves, dried, 10.42. This inorganic part or ash must be derived from the soil. It is of an earthy nature, and can be found only in the earth. The inorganic part which when burned vanished into the air, may [illegible] air again, but it is plain [illegible] must find its mineral f[illegible] [illegible] diminishes [illegible] [illegible] [illegible] ul ef[illegible] ha[illegible] something [illegible] produces [illegible] transplanting [illegible] es, to be worked up in the first place into turnips, thence into the carcases of shorthorns and South Downs, and finally into corpulent Englishmen. If no crops are taken from the soil, the slow disintegration of the rocks and stones and the decomposition of vegetable matter will gradually replenish the exhausted mineral elements; but this is a slow mode, requiring many years to accomplish what one good dressing of ashes will speedily effect.

The great advantage which wood ashes have over other mineral manures is, that they contain not one or two, but all the inorganic constituents of plants. Plaster does well on some soils, and fails on others, because in the first case sulphate of lime is deficient, and in the other it is not, and after a time, even where it does good, its effect ceases, not because the land has become "plaster-sick," but plaster-surfeited, and some other plant food is required. We have known some farmers who, having experienced magical effects from plaster, concluded they could sell their hay and keep up their farms by plaster alone; but we have never known the experiment to succeed for a course of years. The truth is, that in the ash of most plants we find ten or a dozen elementary substances, and plaster only furnishes two of these, namely, sulphur and lime. These are necessary, and so also are phosphorus, potassium, sodium, magnesium, chlorine, silica, aluminium, and iron, and these can all be found in wood ashes, either combined with each other or oxygen. The analysis of the ash of hard wood shews that all these elements can be cheaply furnished, if we can buy hard wood ashes at 20 or 25 cents per bushel. The following is Johnston's analysis of the ash of beech:—

Potash	15.83
Soda	2.88
Lime	63.33
Magnesia	11.29
Oxide of iron	.79
Phosphoric acid	3.07
Sulphuric acid	1.35
Chlorine	.14
Silica	1.32
Total	100.00

Our practice has been to leach the ashes and make soap of the soluble alkalies, and use the

ashes on our land. These are more
than is generally supposed, for only a
the potash and soda is leached out,
phosphate of lime and other valuable
ds, being comparatively insoluble, still

ed ashes can commonly be bought for
price of the unleached, and for agricul-
poses they are worth nearly as much
el, as by leaching they are condensed
or 20 per cent. Potash is the main in-
that leached ashes have lost, and gene-
y four-fifths of the entire amount of this
ingredient. For the same money we
dent more valuable matter can be fur-
e soil in purchasing leached than un-
ashes. If the land is particularly defi-
potash, or if it is desired to raise pota-
any other crop requiring a large per
otash, then buy unleached ashes. But
hates or sulphates are wanted that will
their fertilizing influence for a series
then, by all means, buy leached ashes.
s giving back to the soil the mineral
which are soonest exhausted, and thus
g direct food for plants, ashes also
other valuable purpose in aiding the de-
tion of the particles of the soil, and
them into a soluble condition. Even
flint stone succumbs to the influence of
potash and soda; as every one must have observed who is accustomed to use soda in a glass goblet, the polished glass is soon roughened by potash or soda, the silica being decomposed. Hence the wonderful effect of ashes in stiffening the straw of oats, wheat, and other grains, by rendering the silicious sands soluble.

We have time to mention only one more benefit from the use of ashes, and this is, they furnish the alkalies which will absorb the ammonia wherever decomposition is going on, and then, by the aid of the oxygen of the air, form nitrates of potash and soda, two very valuable compounds in agriculture. In order to secure their formation, however, we must have the decomposition of some bodies that will furnish the ammonia; and this leads us to say that ashes will act with most force when the soil is enriched with ammoniacal manures. If we wish to find nitrate of potash (saltpetre), we look for it in the soil under barns or horse-sheds, where the urine has settled and where the rain has not dissolved the nitre. From the rich soil of such localities our fathers leached their saltpetre from which they made their gunpowder. Unless nitrogenous manures are used in connexion with ashes they will fail after a time to exhibit much virtue, but when the land is properly enriched, ashes operate with full force, and their effects continue for many years.

RATIONAL CULTIVATION.

AN interesting paper on the above subject has been read before a meeting of the Victorian Agricultural Society, by Mr Mitchell, who commenced by stating some of the practices pursued by farmers in the colony, which were not rational. He said the growth of the same crop year after year on the same land, "wheat after wheat," for instance; the production of successive grain crops without any manure, and with only an occasional bare fallow when the land becomes foul; burning straw instead of converting it into manure by the aid of stock, and restoring it again to the land; the laying down of land to grass after it has been exhausted by the growth of grain—these are some of our practices that are not rational, because opposed to the laws of nature—rotation and restitution—which govern the growth of plants and the continued fertility of the soil.

NECESSITY OF ROTATION AND RESTITUTION.

Rotation, I have said, is a law of nature that governs the growth of plants, it compels change of soil or situation. No plant will thrive continuously on the same spot. This applies as well to oak and pine forests as it does to wheat, oats, or any of our cultivated crops. The necessity for rotation or change of crop is caused partly by exhaustion in the soil of elements essential for the healthy growth of the plant, and partly in consequence of the excretory matter thrown off by the roots, rendering the soil unfit for its further growth. Yet one plant, by its death and decay from these causes, makes the most suitable preparation for the healthy growth of some other plant belonging to a different order. In this way, the great globe we inhabit has been converted out of barren rock into the thi[illegible] now see it, and [illegible] itter [illegible] of man [illegible] present [illegible] illustrat[illegible] advantages of rota[illegible] supposed that, by atten[illegible] proper rotation of crops—one crop prep[illegible] the ground for another, the farmer could go on producing crops, without [illegible] time. Increased knowledge has dispelled that illusion. We now know that, in conjunction with rotation, we must also have restitution, or compensation, if we would maintain the fertility of the soil, and avoid barrenness. Restitution and rotation should be the watchword, the creed, not merely as a matter of faith, but the everyday practice of all who desire to cultivate rationally. We cannot go on ploughing and sowing, reaping and mowing, taking all away, and giving nothing back to replace the mineral substances removed from the land. We cannot, I say, long continue this system of robbery, even with some sort of rotation, without being brought face to face in the long run with one of these two alternatives, restitution or barrenness. The time, of course, will vary with the quality of the soil, but the end must come. How little this inexorable law of restitution seems to be understood, or if understood, how much we, by pursuing our present exhaustive practice, seem to disregard it! Yet it is no light matter, but one fraught with serious consequences to any community where a system of spoliation is carried on, instead of rational cultivation.

The other day I met with the following statement bearing on this subject, in the leading columns of one of our daily journals, in an article commenting on mining leases. In making a comparison between the charge for a mining lease and the cost of agricultural land, the writer proceeds to say:—"Agricultural land rightly passes at a small charge from the Government into the permanent possession of the cultivator, because, by the labour of him and his successors, it will continue for generations without number to yield the prime necessities of life, food, and raiment, to the inhabitants of the State, because, [illegible] cultivation makes of it the commissariat, [illegible] which the State could not exist." Now, [illegible] holds good only where rational cultivation [illegible] carried on; under an exhaustive system there [illegible] absolutely no difference between agriculture [illegible] mining. The miner works out his claim, the farmer works out his farm. The former [illegible] 'metallic treasure," wealth's representative, and the latter abstracts, by means of [illegible] crops, the real worth of any nation, the fertility or producing power of the soil, [thereby destroying "the commissariat, without which the State cannot exist."

EXHAUSTION CAUSED BY "SETTLING" ON SMALL PORTIONS OF LAND.

Our State looks on with indifference at a condition of things that must, in the course of a few ars, seriously affect its own existence. Nay, ot only does the State look with indifference on e present system of spoliation without making ny attempt to introduce a more rational one, ut it actually, by "settling the people" on too mall portions of land, renders an exhaustive ractice compulsory on the part of the poor ettler. With the frightful example of America efore our eyes, and none of her vast resources n the shape of rich agricultural land at our ack, we fail to profit by the lesson. There, in merica, such is the distance grain has to be ransported over country rendered more or less arren by spoliation, that unless the price of wheat rules at from 55s. to 60s. a quarter in Britain, it will not pay the farmer in the "far west," where the work of destruction is still going on, to harvest his crops, and they are llowed to shed on the fields. Nearer home, we read of an exodus of farmers from already exhausted districts of South Australia, coming to Victoria to take the benefit of our recent Land Bill, and, of course, to pursue the same system here that has led to the necessity of their leaving South Australia. But to come home within our own colony, we are told, by the *Hamilton Spectator*, of farmers in the western district, who, having exhausted their own freeholds, are now renting land on a short ease at a high rent, for the purpose, no doubt, of carrying on the same exhaustive practice. Meantime, they have laid their own farms down o grass, to recover the lost fertility. Delusive hope! If it be the mineral constituents of which he soil has been exhausted, there is but one way of restoration, and that is by restitution. However, "the convenience of the arrangement," it is said, "is quite mutual, for the landowner will get a far higher return by letting his land for 15s. to 20s. per acre, than he would by keeping a couple of sheep to the acre, and the tenants will be able to make larger annual gains." From this it would appear that the American system, when "the settler subdues a piece of land, flogs it to death and abandons the carcase, and then repeats the operation on a new subject," a system that has been condemned by thinking men in all countries, is in full force among us; indeed, some, it would appear, have already managed to compass the death of the first victim, and are seriously setting to at the second. With our "limited area of good agricultural land," this is surely an unwise course to pursue, and must be attended by disastrous results. But then "the landowner gets a far higher return, and the tenant larger annual gains." Here we have the true secret—an insane desire to convert the fertility of the soil, at all hazards, into hard cash—to sell the birthright of mankind for a few pieces of glittering ore! Curious anomaly of human law this! We will not allow a poor miserable wretch to destroy his own miserable life, but we make no attempt to prevent the destruction of that which maintains life. With lettings like that in the western district, and the Government selections of 80-acre lots, how can we expect any attention to be paid to the natural laws of restitution and rotation, or any attempt at rational cultivation?

PROFIT THE PROOF OF RATIONAL CULTIVATION.

Having pointed out some of our farm practices which I conceive is not rational, and endeavoured to shew you why I think so, I shall now pass on to the question, What is rational cultivation? "The object of farming is gain. Whether an agriculturist grows bread to strengthen man, wine to gladden his heart, oil to make him of cheerful countenance, or opium to poison him; whether his barley be made into wholesome ale or deleterious gin, he has but one concern—does the cultivation pay?" This being the case, and the object gain, the system that enables the farmer to obtain the largest quantity of healthy produce at the smallest cost, and realize the greatest amount of profit, but—pray, you mark this well—"without permanently lessening the fertility of the soil"—any system that will fulfil these conditions may be pronounced a rational system of cultivation. The fertility contained in the soil is the farmer's capital; when he sells his crop, he sells part of this capital. If he does not restore to his land, in the shape of manures, the fertilizing substances taken away in the crop sold, his land will be permanently so much poorer. He is then living partly on capital, instead of on interest alone. This is an erroneous and too common practice. By following it, the capital originally contained in the soil is year by year diminished, and the farmer, with diminishing crops of grain, as a matter of course, obtains less and less of interest, not only, mark you, on the capital in the soil, but also on the capital he employs to work his farm. True, the farmer may, by this unwise course of practice, when his land is in its virgin freshness, manage to save money, but such savings cannot all be regarded as legitimate profit, because he has simply been transferring part of his capital out o the soil into some bank. Should he farm the same land long enough, his bank account will dwindle away again, for "the spoliation of land leads to poverty." Now, by following the opposite, that is, the rational course, and restoring again to the soil annually, in the shape of manures, those elements of fertility carried away in the crops sold off the farm, the farmer will retain his capital in the soil intact, and will always obtain undiminished interest on both the capital in the soil and that employed in working the farm. Does some one inquire—Will this rational system, this constant manuring, will it pay? Well, all I can say in reply to such a question is, if it won't, we have no business with the land. Why disturb the squatter? Why destroy his rational and profitable employment of the land in the production of wool and tallow, if we take it only to pursue an exhaustive system that must, in the long run, end in rendering it useless for cultivation, and unfit even for the production of wool and tallow? The fact is, if we, as farmers, are to continue to cultivate, we must cultivate rationally. It is a case of "Hobson's choice, that or none." We must also make it pay, for that is one of the conditions. How, then, are we to set about it? It is not my intention to attempt to lay down any course of cropping. Every one must decide this matter for himself, according to circumstances, climatic conditions, and local requirements. In one part of the colony it may be dairy stock in conjunction with grain growing; in another, sheep; in a third, the purchase of phosphatic manures, and the ploughing in of an occasional crop of green manure. So that it becomes simply impossible to point out any specific course whereby to attain the desired end. But this I may say, that whatever system may be adopted, it must be based on the laws of restitution and rotation.

BEGINNING AT THE WRONG END.

In colonial agriculture generally, the natural tendency seems to be to begin at the wrong end. Instead of starting from grass and the depasturing of stock, the production of grain is made the starting point. By the continued production of grain alone, the land becomes exhausted, and thereby unable to produce grass except of the most worthless and innutritious description. Now, the rational course would be to start from grass as a basis, and, in conjunction with this, through green crops, stock, and manure, advance to grain; then, in the course of any rotation, back again to grass. The laying down of cultivated land to grass, after a course of cropping, may be likened to putting it to bed; of course, the more comfortable we make it the better it will rest, and consigning it for a time to "nature's sweet restorer, balmy sleep," which, if I may be allowed a slight liberty with poetic diction:—

> Swiftly on dewy pinion flies from fields
> Of woe, too often cropped with golden grain,
> And lights on slopes unruffled by a plough.

The bare fallow is like poking up the fire to make it burn away all the faster. But a green crop put in with plenty of good muck, and fed off on the land, is the true "roast beef of old England," and will be followed by plenty of bread and cheese and beer. As I have said before, if we take care of the grass, the grain will take care of itself. To do this, we must take care of the muck, and to get muck we must have stock of some sort. By means of stock the farmer can collect together part of the capital contained in the soil of his grass land, and apply it to his arable land for the time being. By thus concentrating his fertile capital, he will secure a larger and more certain return for his outlay on the labour of cultivation. In this way the fertility of the farm will be made to rotate on the farm itself, along with the rotation of crops, and if restitution is made for loss suffered by produce sold, this system may be carried on to the end of time.

The first step, however, towards the initiation of such a course of practice, is the sub-division of farms into fields; the next, keeping stock and taking care of the muck; after that, rotation of crops, and last, but most important of all, restitution. Under present circumstances, as regards population and cost of labour, not less than three-fourths of a farm should be under grass, "bush grass," of course, in the first instance. The larger the farm the larger should be the proportion of grass land. That a system of rational cultivation will not pay in this colony I deny. The truth in this matter is not left without witnesses. For, although an exhaustive practice is the prevailing one, and tenant-farmers can hardly be expected to follow any other, yet I know several farmers who cultivate their own freeholds on a rational system, and who make it pay too. It is also a cheering sign of the times that many are now impressed with the necessity of some change, and anxious to adopt a more enduring system. Spoliation, it has been found, will not continue to pay; and this brings me to the third part of my subject, in which I promised to notice some things which I ould tend to promote rational cultiva-

TANCE OF FARMERS' CLUBS AND THE AGRICULTURAL PRESS.

on the list of things that would tend to
rational agriculture, I will venture to
farmers' clubs, such as this Society
the honour of introducing to the
or, as they might be called, farmers'
for grown-up pupils, "where each by
teacher and is taught." They are the
adily available and practicable means of
ural education that we have at hand.
clubs and the national shows of the
nd Highland Societies have done more
nce British agriculture to its present
of high excellence, than anything else.
ave taught the British farmer to think,
xpress his thoughts. I can assure you,
h you may not think it, I read with far
terest and profit the papers and dis-
s of some of those farmers' clubs
old country, than I do even the
entary debates in our own. Through
lubs, and the agency of the press in dif-
he knowledge gleaned at their meetings,
that strength which such union gives,
tish farmer is fast becoming a power in
e. Instead of being considered a mere
and told how he was to vote at elections,
re long dictate to his landlords how they
te in Parliament on such questions as
me-laws" and "Tenant Right." Now,
rs' clubs can effect such revolutions as
ve done, in the practice, in the social and
ual position, and in the political influ-
the farmer at home, why should they not
the same results in this country? Here
quietly, for the want of some such union,
one of the curses of England, the
aws, to be fastened upon us, and never
ng a thought upon "Tenant Right."
s' clubs are a far greater necessity as a
f collecting and diffusing information in
country like this, than in an old one.
have a climate so widely different from
he old country, that we have, as it were,
n afresh, and elaborate a practice in
nce with climatic and local requirements.
can aid us more in doing this, and in
some course of rational cultivation,
iodical meetings of farmers, to "reason
" on questions affecting their interests
progress of their art. By such means
luable facts derived from practical experience, and that would otherwise be lost, will be collected and recorded. It is from farmers' clubs that some scheme for the education of young farmers should emanate, and the neglect of their education, as I have already pointed out, may be attended with injurious consequences to the State. The formation of these clubs should be a simple matter; all that is requisite is fixed times for meeting, a sensible chairman, active secretary, and the apostle Paul's definition of charity, slightly modified, as rules for the guidance of members. I hope soon to see them flourishing in every district in the colony, and I feel sure their establishment will be attended by good results to farmers themselves, and to the community at large.

TENANT-RIGHT ESSENTIAL.

Another thing that, in my opinion, would promote rational cultivation is a law of "Tenant Right." This may perhaps sound strange in a new country where every one is supposed to sit under his own vine and fig tree. Still, it is nevertheless a fact that we have a large and increasing class of tenant-farmers amongst us. The conditions here are very similar to those which, in Ireland, have led to such a complication of interests between landlord and tenant, paralyzed industry and energy, and retarded the progress of rational agriculture in that country. We too have our absentee landlords, and tenants have in most instances to make all their own improvements. The sooner we have some legal enactment that will secure to the tenant-at-will, in the event of having to leave his farm, just compensation for permanent improvements made by him on the farm, and for unexhausted improvements in the soil, the sooner we have some Tenant Right of this sort the better, as such a bill would materially tend to promote rational cultivation by tenant farmers. Our meat-preserving companies, too, inasmuch as they will tend to maintain a higher standard of value of stock of all sorts, and the praiseworthy—I might say patriotic—efforts of Mr Matthew M'Caw to induce farmers to manufacture cheese and cure butter and bacon in such a way as will secure for them a European market, may be justly regarded as tending materially to aid and promote a rational system of cultivation.

SUCCESS DEPENDENT ON OBEDIENCE TO NATURAL LAWS.

But above and beyond all things, I would urge upon the attention of cultivators the duty of reverence and respect for the laws of nature ordained by an all-wise Creator, without which permanent success in cultivation is simply unattainable. The more we study and examine those laws, the greater will be our reverence and respect, and as we obtain clearer views of the wisdom, beauty, and harmony of creation, the stronger will our convictions become that they cannot be outraged, infringed, or disregarded with impunity. Science expounds those laws. If, in the course of my remarks, I may seem to iterate and reiterate certain things, it is because I wish them to be remembered and thought about. The subject, I need hardly say, is far from being exhausted, and I only regard the few thoughts I have thrown together in this paper as a peg upon which you will hang more valuable information; and I will conclude with the following quotation, which may be carefully studied by statesmen as well as farmers :—"Thus, my friends," says the profound Goethe, "if we survey the most populous provinces and kingdoms of the firm earth, we observe on all sides that wherever an available soil appears, it is cultivated, planted, shaped, beautified, and in the same proportion coveted, taken into possession, fortified, and defended. Hereby we bring home to our conceptions the high worth of property in land, and are obliged to consider it as the first and best acquirement that can be allotted to man; and if, on closer inspection, we find parental and filial love, the union of countrymen and townsmen, and therefore the universal feeling of patriotism, founded immediately on this same interest in the soil, we cannot but regard that seizing and retaining of space, in the great or the small scale, as a thing more important and venerable. Yes, Nature herself has so ordered it. A man born on the glebe comes by habit to belong to it; the two grow together, and the fairest ties are spun from their union. Who is there, then, that would spitefully disturb this foundation-stone of all existence; that would blindly deny the worth and dignity of such precious and peculiar gifts of Heaven? And yet we may assert that, if what man possesses is of great worth, what he does and accomplishes must be of still greater. In a wide view of things, therefore, we must look on property in land as one small part of the possessions that have been given us. Of these the greatest and most precious part consists especially in what is moveable, and in what is gained by moving life." The "moveable" and "moving life" of the soil is its fertility, and statesmen, as well as farmers, will do well to prevent the ignorant or wanton destruction of this "foundation-stone of all existence."

Papers by Tim Bunker.

V.—TIM BUNKER ON SHEEP TRAPS.

'HAT upon airth d'ye call that?" asked Uncle Jotham Sparrow- he hailed Seth Twiggs in the road rning. Seth had a gun over his ;,.and held in his hand what might en mistaken for game at a short . On closer examination, the object . a pair of short ears, a prominent long, clean pair of jaws, well armed arp bloody teeth. It was what is ι dog after his tail has been cut off ind his ears.

t is what I call a sheep trap," said he flung the head upon the grass, ıis pipe out of one pocket, and a ut of the other, and lighted.

y, that is Jake Frink's dog!" ex- Uncle Jotham.

ıt Jake's any longer," replied Seth. ;, I caught him in the act this morn- . He was gnawing away at a sheep un down, and that is sheep's blood on his teeth now. I put that bullet his eyes, and he hadn't time to s teeth before he emigrated to t'other That trap has caught three sheep this spring, besides lots of my neigh- o say nothing of the lambs; and I afraid the trap might be set again st cut his head off after I shot him, sure work of it. That creature has d £20 worth of property this spring, t a doubt. Sheep have been found ıd badly maimed, and he has been asing them. When complaint has de to Jake, he could not believe he ty of even chasing sheep. He did r him in such tricks. His dog was ent as a lamb. Children could play ı, and he wouldn't even growl. To ce talk, you would think the dog's nust have been a sheep. Well now, ye see, that talk didn't go down with me. I can tell a sheep-stealin' dog as soon as I lay my eye on him. There is a kind of guilty look about the creature, that says mutton, as if it stuck in his jaws. Jake has never been able to raise sheep. If he tried, his lambs disappeared mysteriously when that dog was a puppy. He always laid it to other folk's dogs. But Rover was the guilty wretch that drunk lambs' blood. I have been watching him for about a week, and ye see this morning I got him jest where I wanted him. There was a piece of mutton in his mouth when I fired. It will take a smarter man than Jake Frink to get away from that fact."

"I guess you'll catch it when Jake hears of it."

"He won't have to wait long, for I am going to take home Jake's sheep trap this morning. I wouldn't have you think that I'd shoot a man's dog, and then not own it. That would be too much like a sheep-stealing dog. I calculate to take the responsibility."

This conversation of my neighbours shews the way the current is setting on the dog question, and the progress the reform is making, under the new laws, and especially under the high prices of wool and mutton. This last, I think, has more to do with dog killing than all the laws that have been enacted. Even Jake Frink rubs his eyes and wakes up to the fact that sheep raising is a profitable business. Sheep will live and do well on his poor pastures where his cows grow poor. He will bluster, of course, when he learns that his dog is killed; but he will be resigned, and conclude that his sheep as well as his neighbours' will be safer with that sheep trap out of the way. A large number of poor farmers will invest in sheep, and that will make *them* the natural enemies of dogs. I have noticed that it makes a mighty deal of difference whether it is your sheep or your neighbours' that are bitten or killed. Resignation is a virtue easily practised when a pack of dogs get into your neighbour's flock, and worry and slay. But when you go out some fine morning and find your fattest wether half eaten up, or your full blood Southdown made into mutton prematurely, it stirs the blood at once against dogs. You owe the whole race a grudge. You think of steel traps, bullets, and small stout cords in close proximity to dogs' necks. You talk fiercely and threaten vengeance. Men in such a humour are prepared to legislate rationallyupon the dog license question. They see very clearly that one vile cur, not worth a copper to anybody, may easily destroy £20 worth of their property in a single night. With sheep at two or three times the old prices, we shall not only have good dog laws, but we shall have men that will execute the laws, and the dogs at the same time. The old arguments on this question are just as good as any new ones that can be brought forward, but men see them a great deal better. A sheep is a creature of consequence, just about three times bigger than it was two years ago. The dogs have grown small, and a multitude of them have grown out of sight entirely. There used to be a dog on about every corner of Hookertown. Some families kept a half-dozen, and they had a tight match to get enough for their children to eat, too. Now they are getting scarce in consequence of the dog license, and I am in hopes that the time is not distant when they will be confined to cages, and shewn up as curiosities.

I have hated dogs ever since I was a boy. My father kept sheep, and was a lover of choice mutton, and chose to do his own butchering in a humane and decent manner. remember an old ewe with twin lambs, a cosset who came home with the cows to be petted, and cared for as if she were a member of the family. One morning she was found dreadfully torn by the dogs, just alive, but unable to move and her lambs missing. I've hated the sight of a dog ever since, and ve pass one without an apprehension of a bite, and a great longing to brain him on the spot. Seth Twiggs has given them the right name, "Sheep Traps."

And the morality of keeping a sheep-killing dog is on a par with that of a malicious neighbour who should set steel traps in the sheep walks of your pasture. I would much rather have steel traps than the dogs. The trap would be certain to dispose of only one sheep in a night, while the dog might kill or maim a dozen. The trap and the victim would be found together in the morning, and the mystery of the broken leg would be cleared up. But your cowardly sneaking dog does his work by night and is miles away in the morning, with his chops all licked, and lying by his master's door, as meek looking as if he never dreamed of mutton. The owner of a steel trap is a responsible being, but the owner of a dog seems to think that his brute is what Mr Spooner would call a free moral agent, fit to do business on his own hook. He is not accountable for the deeds of his dog. I go in for trapping rats, skunks, foxes, weasels, and other vermin. If we must trap sheep and lambs, I prefer an article with steel springs and chain to a pair of living jaws on four legs. The latter catches too much game.—Yours to command.

Timothy Bunker, Esq.

NO. LV.—TIM BUNKER'S REASONS AGAINST TOBACCO.

"Why don't you use tobacco, and smoke it like other people, Squire Bunker?" asked Seth Twiggs one day of me, with a discharge of smoke from his pipe that would have done credit to a locomotive.

"Because *you* do!" I replied, a little gruffly.

"Well now, I don't see the force of that, Squire."

"I do. You see, Seth, you and your family are a standing argument against tobacco. You are always smoking, smoking, smoking, and you have pretty much smoked your brains out."

"You weren't in any particular danger on that point, Squire."

ell, I admit I'm not so smart as some neighbours, and it becomes me to take what little brains I have got."

st so," said Seth. "I see."

ur eyesight is darkened half the time," nued, "by that cloud of smoke, and n't know exactly what you're about. aste time and money as well as brains. s you about one-half the time to load ipe, and the other half to smoke it. is a great deal worse since you have em big Dutch pipes, with big bowls ooked stem, than it used to be when d that old stump of a clay pipe that you five years. Then you only put in of tobacco, and you had to stop in ten minutes to take breath and charge But with these big-bellied things, that alf a paper of tobacco, you smoke and and it seems as if you never would You make every place blue where . You go out to feed the pigs in the g, and it takes you twice as long to do ork as it used to. You go into the to hoe, and you pay more attention pipe than you do to your hoe. You d squirt around every cabbage as if it vered with lice, and you don't do an work in the whole morning. The get a start of the cabbage, and your looks—well, I can't compare it to g else but Seth Twiggs in all the -*weedy*. You go into the field to on the turnips, and the worms start of you, and what the worms ill, the weeds smother, so that your fields look worse than your garden. dn't have a man on my farm that used , at half wages. Now, may be you that I don't use tobacco, because *you*

s, I see," said Seth, "and Parson r couldn't have said it better. This has dreadful season for weeds."

son!" I continued, "don't lay it to ny season. This thing grows upon d laziness goes down into your bones, ke goes up into the heavens. You go dreaming you're making a great stir, hen night comes you find next to nothing done. Tobacco, like wine, is a mocker, and if a man don't want to be befooled, he'd better not touch it. That is my opinion on tobacco as illustrated in the life and services of Seth Twiggs, the smoker.

Then to come to the question in the abstract, it is nasty; there is no other word that just expresses it. Don't a man belong by nature to the clean beasts, and what right have I to make myself a nuisance among my kind? It is offensive to every sense. Look into the smoking room of an hotel, or a steamboat, and was there ever a stable fouler?—splashes of juice, ejected quids, cigar stumps, and a reek "that smells to heaven." Won't the world be foul enough without my joining the smokers and chewers?

"And it is a very expensive habit. Your tobacco would cost you £6 a-year if you did not loan it, and if you take into account your losses of time under the influence of the weed, it costs you four times that sum. You stop to talk with a neighbour, and it makes you long-winded, for your brain is so bemuddled that you never know when you have done. Many a man spends £10 a year for cigars, and if one has a good deal of company, it is very easy to use up £20. Your friend who smokes never knows when he has enough. He always wants one more of the same sort, and the result is, that your box of Havanas is gone very quick, and you can't tell how or where. This makes quite a hole in the income of a man who lives by his hands, or by his brains. I have brains enough to see that I can't afford it.

"It is very bad for the health. The doctors are all agreed on this, even those who use it. It don't help digestion. It don't save the teeth. There are better ways of reducing the flesh—eating less, for instance. And if the doctors were not all agreed, every man who has his eyes open can see that no man has sound health who uses it in any shape. They call themselves well, but have headaches, indigestion, don't sleep well, are nervous, have the fidgets, or some other complaints. Occasionally they break down under paralysis. Many make complete wrecks of their bodies. Always life is shortened. Now, what right have I to make an invalid of myself, and go through life sighing and groaning, when I ought to be well? It is worse for a man's mind than it is for his body. It makes him forgetful. He loses the control of its powers, and can't think connectedly. He forgets the names of persons and places, his own plans, and, in short, about everything except to smoke. There was our minister, the one we had before Mr Spooner, smoked himself out of his pulpit. His health failed, and his sermons failed worse than his health. They were so foggy that even Hookertown, that never dismissed a man before, could not stand it any longer.

"Then it is a bad thing for morals. It begets a great craving for stimulating drinks, and very generally leads to their use, and when a man gets to drinking, he is in a fair way to do almost any thing else. What right have I to endanger the morals of my neighbours, even if I could smoke with entire safety?

"Then I have got children and grandchildren, and I think the best inheritance I can leave them is a good example. John would smoke if I did. What right have I to pollute the faces of my grandchildren with the stench of tobacco? I want them to have pleasant memories of their grandfather's home in Hookertown, and I should not feel sure of it if I scented myself and my house with tobacco.

"Then I am the husband of Sally Bunker, and I think she has the right by marriage vows to a decent companion in life, with a clean mouth and shirt bosom. What right have I to make a nuisance of myself in her home, to scent her bed with this unsavory perfume, and to befoul her rooms with quids and stumps? I am a little too proud to do that.

"Then I could not tempt my neighbour to use what I would not use myself. When I look at Seth Twigg's farm and my own, I like the contrast.—Yours to command,

TIMOTHY BUNKER, Esq.

The Veterinarian.

MALIGNANT CATARRH IN CATTLE.

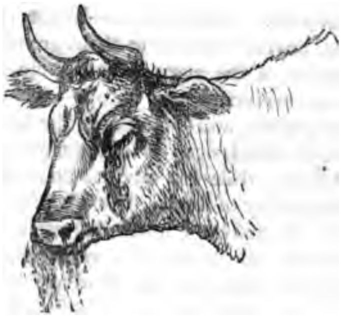
Clater's valuable "Every Man own Cattle Doctor," we extract g, from the pen of the editor, Mr For the cuts we are indebted rtesy of the publishers, Messrs Varne & Co :—

t catarrh or coryza, known also as renoza, has been confounded with morrhagica and cattle plague or n some points of which great re- xists.

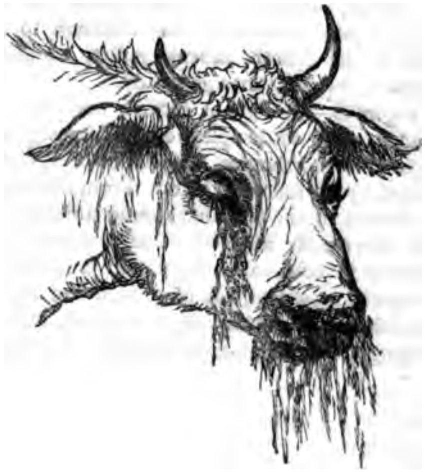
A specific or malignant condition l in which catarrhal signs are pro- ting chiefly the sinuses of the head tle and oxen generally. Old cows ffected. It has been denominated, f the ox tribe."

.—Three stages of the affection ribed. In the *first*, a shivering-fit rved, and the animal is separated t in the pasture. Shortly he is dull, held low, ears pendulous, visible are of a bluish-red colour and dry. e closed and swollen. Tears flow, nnot be endured. The muzzle is and saliva is sometimes discharged There is a painful cough, pulse is full, but the heart's action is feeble. ecomes even more painful as the nces, and the breathing is accele- ometimes catching. The bowels fœces black and hard, but shortly sues. The animal is thirsty, but and the urine is scanty, offensive, gh colour.

d stage occurs within eighteen or hours from the appearance of the disturbance, and are denoted by a nge in the character of the dis- e membranes of the eyes and nose a purulent secretion, having an f blood and ichor, which irritates sore the skin over which it flows. inuses of the head, large accumulations of pus occur, and when the bones over them are tapped by the fingers (percussed) a dull sound is emitted. If the mouth is opened, red patches will be observed, which in some places will have fallen off, exposing a foul ulcer beneath, and the membranes are now of a deeper purple hue, and the breath fœtid. The animal is lame, and experiences great pain when urine or dung is discharged. Pregnant



Malignant Catarrh, first Stage.



Malignant Catarrh, second or Sloughing Stage. Horn removed, and ulcerations have appeared on nose and lips, &c.

animals are almost sure to cast their young (abort). From the first, an increase of temperature may be noticed, but now the thermometer registers 104 deg. or 105 deg. F.

Third Stage.—Great prostration is evident. Sloughing of membranes extensive, and probably the horns and hoofs have come off. The pulse has become imperceptible; convulsions ensue, with general coldness. The thermometer indicates a rapid and unusual fall, 90 deg. to 95 deg. F., being the amount of heat that can be registered at the rectum. Sometimes ulceration of the cornea is effected before death, and the contents of the eye-ball discharged, giving rise to a great amount of additional pain.

Post-mortem Appearances.—These will be apparent, having alluded to them greatly in an enumeration of the signs. The whole series of membranes—mucous and serous—are studded with ecchymosis, and sometimes the brain and spinal cord afford signs of inflammatory action and softening, while the cavities contain an increased quantity of fluid. The whole organs of the body are softened and congested, and the blood-vessels are filled with dark or black fluid blood. The sinuses of the head are filled with offensive pus, the bones are softened, lining membranes covered in places with blue or purple spots, while at others the epithelium is removed, and angry-looking ulcers occupy its place, having discharged blood before death. The surface of mucous membranes have a livid or Modena red colour. Removal of epithelium, with the changes just stated, are also common to the back of the mouth, fauces, gullet, windpipe, stomach, and intestines generally.

Diagnosis.—Malignant catarrh may be confounded with cattle plague (rinderpest), and purpura hæmorrhagica. It is, however, distinguished by the following tests. From rinderpest it is known by the fact that young animals and oxen are chiefly affected; that it occurs after exposure to cold, rains, &c.; that only one, or perhaps at most two, out of a herd are seized and with their death the affection ceases, thereb [illegible] pura hæmorrhagica it is known by tl of diffused swellings and sanguineoı or sero-sanguineous (blood and seru tions from the skin.

Duration.—From four to nine, or el The writer's experience of the affectioı confined to some of the most rapid ca

Treatment.— Remove the animal pasture, and place it in a comfortable with good bedding. Cooling or e lotions (Nos. 2, 3, 4, 5, 6, pp. 30, 3 &c., should be constantly applied to Bleeding moderately, while the pulse i be attended with benefit. Injections thrown up, and a laxative dose adn such as the oil mixture recommende pura hæmorrhagica, or the following

RECIPE No. 25.

Take of Epsom salts . . .
Calomel . . . . .
Ground ginger . . . .
Treacle . . . . .
Warm ale . . . .

Mix, and give to a two-year-old be thirds for one a year old; half at si and quarter for lesser animals, as calv and large pigs. A long seton plac dewlap, in the earliest stages, also pr ficial. Two to four drams of nitre ma in water three or four times a-day. ammonia also, in doses of one to four similar intervals, in water, during the of great fever.

When the animal is found at the te of the second stages, mineral acids given after the laxative medicine—suc as are recommended in Recipes Nos. page 69. Solutions of carbolic acid rous acid gas and chlorine in water, used for the purpose of dressing the wo cleansing the points of discharge, &c also be necessary to open the sinuses a them, using the same solutions. S etons passed through them are frequent stimulants are needed from mencement of the second stages.

The Garden.

HYACINTH AND OTHER DUTCH BULBS.

BULBS of all kinds are highly interesting, particularly as most of them are lothed with inflorescence of more than verage gaiety; but the general favourites of ie English, Continental, and American rowers are the various species of Dutch ulbs. Our excellent foreign correspondent as dealt a severe blow to all such as have elighted to run the hobby of acclimatization extremes, planting himself firmly upon the round under the protection of that matchless eapon in paper defence—practical experince. But there is no rule without some exeption, and the exception in this instance, our thinking, must be credited to vigour constitution, combined with what might be lled floral capacity. If both traits of chaicter are not maintained, then acclimatizaon is a misnomer. Often the forcing pross has induced the reproduction of flowers at ie expense of foliage, and deterioration and ath have been the ultimate issue. But our ject in introducing acclimatization at all st now is to shew that the phrase could ly have a meaning with such plants, so astic in the hands of a cultivator, as hyanths, tulips, and narcissuses. Variety of imate does and it does not affect them. does affect them if you have the burning, pical heat of harvest when you ought to ve the moist, mild heat of spring. Plant ripened bulbs in the best staple for root pagation known, and if the ground heat 80 or 85 degrees, and the surface heat in portion, the growth and flowering life your bulbs will be paralyzed. Heat does affect either of the bulbs mentioned iniously if they have been placed in a moist d medium, favourable to the development propagation of roots. Every bulb must e its spring time to develop the nascent leaves and roots. By adopting a too severe forcing system without using the necessary precautions, nature is tortured and abused, and consequently rebels. Once, however, root dominion has been secured, the heat of the tropics will not destroy the floral development of either hyacinths or tulips. It may depreciate the quality and persistency of bloom, as it certainly does hasten the time of harvest; but the triumph of the culturist in contending, and contending successfully, too, with difficulties which are not present in a state of nature, is unquestionable.

No one would reckon this little triumph of art over nature in accelerating, or, it might be, retarding the flowering time of plants, as the beginning of a process of acclimatization; and yet it is at least equally entitled to the name as anything we have yet seen or heard of exposed to the gradual process of enduring cold in the one country or heat in the other.

The capacity of Dutch bulbs for general cultivation over a wide area of longitude and latitude is well known. Their powers of endurance have been well tested; hence their popularity. Unlike most other plants in cultivation, the chief of the bulb community —the hyacinth—must be furnished us from trade houses every year. Given four or five or six months' cultivation, the hyacinth is in the height of its beauty; another month more, and it fades, and all symptoms of leaf life are gone; and for all practical purposes, so far as the general grower who imports the bulbs, or gets them imported for him, is concerned, the bulb may be tossed aside, or, if retained, planted out of doors to give a few little spikes of flowers the following year. Then the parent bulb will break out into ofl , which must undergo a cultivating process, until they become large enough for flowering strong on their own account. This is something like the process carried out in the Dutch gardens. We cannot do the thing well in England. Dutch climate and Dutch soil favour the cultivation of the bulbs in question, and hence we have not only hyacinth and tulip gardening in that country, but, more properly speaking, hyacinth and tulip farming, to supply the vast demands coming from England, France, and America, not to speak of other nations and peoples that grow them.

In this country, hyacinths particularly have been looked upon by the upper ten thousand as indispensable for decoration of many kinds, from the various uses to which they are applied in-doors to that of conservatory, greenhouse, or flower border. Beautiful and useful as they are for greenhouse decorative plants, or as groups in the spring flower garden, their beauty or utility is tenfold enhanced when we look upon them in a well-grown state in living rooms. We are trained to know that plants generally can only live where the elements of light and air are present in abundance. When we think, therefore, of the piles and piles of buildings that of necessity are crowded together in all cities, we are all but hopeless that plant life could put on a respectable appearance within their area.

And yet when we reckon up all that have been tried and found to do, there's a goodly array of plants that will bear the sufferances of subdued light, partial ventilation, and an atmosphere largely charged with dusty particles. Chief among them is the hyacinth, and it is doubly welcome, coming as it does when duskiness and cold prevail, when

> Faded and gone are the summer's sweet flowers,
>   Strewn by the wintry winds o'er the dark mould;"

when deciduous trees are robbed of their beautiful foliation, and when all nature out of doors seems to be locked fast in an icy embrace. Then, and then especially, does the lady gardener turn, with the flushed countenance of satisfaction, to the hyacinths and tulips, and crocuses and snowdrops, blooming so charmingly in the cabinet of the drawing-room window, or on that improvized ledge of the sitting parlour; or, if the perfume is found to be too oppressive, in corridor, entrance hall, or in the case-like designs formerly represented in Window Gardening.

It has been said, and it was docqueted by a remark of our own, that the chief of the bulbs in question was early fondled over and grown by the "upper ten thousand." "Is this so?" Not now certainly, for in the rapid strides of progress of all kinds must be ranked the growing taste for horticultural subjects, and such of them particularly as are found suitable for all conditions of mankind. It would be more correct to propound that the cultivation of Dutch bulbs, so far as our own country is concerned, had extended to the *upper million.* Not that horticulture generally has advanced at that ratio, but the desire for in-door plants has manifested itself to such a degree among dwellers in cities, and hyacinth culture has been so facile wherever tried, that thousands outside of the pale of what is generally understood as gardening altogether, have been wedded to it, partly by the love of flowers and partly by the force of example.

Now a seasonable reminder is good at all times, and we present this one to our readers in their own interest. *Now* is the time to select your bulbs. It is an old adage and a wise one, "The early bird gets the early worm." To procrastinate is to lose. It may be but very little, but that little is worth securing. Send in your orders early, not only for the purpose of securing the best bulbs, but to get them potted early. In attempting to make a selection you may be disappointed, but you cannot be disappointed in the manner of potting. The largest bulbs do not always yield the best flower spikes. Very often they have two and sometimes more centres of growth, and that is not desirable. A moderate sized bulb, with its concentric layers of scales firmly compressed, and its centre well raised, is as likely to be productive of a model spike as almost any other form or size you like to bring in competition with it.

potting, if not absolutely necessary, e productive of a harvest of finely ed flowers of good quality, persistency, en colour, than those that have not tended to at the nick of the growing

You may plant, to be sure, from ber to the end of December, and have od flowering spikes, if your blooming is to be during April or May; but wish an early, a continuous, and a tory bloom, order your bulbs to be during the month of September.

nt your bulbs," you say, "but how y to be planted? I don't care for acinths, I prefer all mine grown in " Even ladies who grow hyacinths es, are to attend to the instructions securing the bulbs and planting rly.

Glasse's celebrated reminder, in her for cooking, is equally applicable our instructions can be of any value. possession, however, and the glasses readiness, filled with water to the nd to the neck only, then set the position in the receptacle scooped rather moulded, for their convenience formal point of view, and store your or placed hyacinths in any dark out- ay place, in a wine-cellar for instance, ach glass may "nod" at one another. ey may be imprisoned for three good to come, needing almost absolutely , not even much replenishment from er-pot. Cold, comparatively speaking, kness, are elements congenial to their t that stage. Like the busy bee, the re not idle. The organizable matter as been formed and stored during a of growth in some of the distant farms, takes an active form in the e of moisture, and roots develop ves all round the circular base, and n in nearly parallel lines to the bot- the glasses. All this is going on ere is but little appearance of the owing upwards.

is something like the growing charac- of the hyacinth; and if the cultivator urs, by the pressure of too great heat, to incite top growth in advance of bottom growth, failure is the inevitable issue. Hence the wisdom of keeping the bulbs dark and quiet, so to speak. Root formation and propagation is best promoted, unless in such a family as some of the species of epiphytal orchids, in total darkness. To place hyacinths in glasses where a constant flood of light prevails, is not good practice. All ladies will please remember our advice, and if they do so, they are sure to profit by it.

But there are other conditions essential to success which must not be disobeyed or disregarded, either willingly or unwillingly. The amount of attention to our first precept of cultural routine cannot make up for bad after-management. Many, unfortunately, and doubtless numbers of our constituents may be counted within the number, do not know better, and become the unwitting agents of incorrect practice. Although it is good to grow hyacinths and tulips and narcissuses, and even crocuses and snowdrops, in wine cellars, or other dark cool places during the incipent stage, it is very bad to keep them always there, and bad to keep them there too long. It is not very good to take many of the sorts even after the glasses and pots are well filled with roots, and roast them, so to speak, on the top of the parlour mantel-piece. It is not good practice, even supposing the glass hyacinths were placed in the window-sill, to keep them pent up like invalids in a close warm temperature, frightened to change the air of the room in case the plants should "catch cold"—be checked in growth. This unfortunately is too often the practice, as the expert in matters horticultural will tell you the moment his eye observes the plants. Instead of lusty, they will, under this treatment, have ill-conditioned foliage so lean and poor, that it will require the support of crutches; and then the flower spikes will be lanky, the flowers wide placed apart, and the colour of the variety only an apology for what it ought to be.

But we have dwelt so long upon other points that we must reserve our various prescriptions, and discourse upon them at length in a future issue.

A FEW REMARKS UPON HARDY FERNERIES.

THERE is usually a corner to be found in Villa Gardens, however small, in which all attempts to make flowering plants thrive satisfactorily proves abortive, and the place consequently becomes neglected—an eyesore and disgrace to the otherwise trim and well-kept garden. Now, such a spot will usually be found to suit ferns admirably, from the fact, that the conditions necessary to a full development of their fronds is not favourable to the production of flowers; and to those amateurs who have no ferns, I say most emphatically, procure some immediately. The beautiful green of the fronds of ferns is most refreshing upon a hot summer's day, especially such summer days as we have lately had, and they are exquisitely beautiful when grouped with cut flowers in vases for the decoration of apartments; indeed, a bouquet of flowers is incomplete unless fern fronds are in some way associated with them. This being an acknowledged fact, every amateur who loves to make his home a home of taste, should endeavour to grow a few of these gems of nature to add to its charms.

Now I trust no one will allow themselves to be impressed with the idea that these plants are difficult to grow, because such is directly opposed to the real facts of the case; and I hope the few plain remarks upon their management, here offered, may induce many to cultivate hardy ferns who have hitherto been deterred from doing so by wrong impressions of the treatment necessary to success.

In the first place, the site has to be selected. We often hear a remark similar in import, if not exactly in the same words as this, "What can we do with that corner? It looks very bad and quite mars the appearance of our ittle lawn; nothing seems to thrive there, and the wall looks, to say the best for it, simply ugly." Now, my reply is, that is the spot for a hardy fernery. Nothing will grow there but ferns; it is under the boundary wall; it has perhaps a northern aspect; it is shaded by large boundary trees, which latter with their roots rob the soil of all its moisture. A spot with all these conditions is the *beau ideal* of a site for ferns.

To turn such a spot to proper account, the first thing to be done is to throw up a bank of earth to a height of 3 or 4 feet, to form a sort of boundary line, and to enclose it from the rough, boisterous winds, at the same time leaving a pathway into it in whatever position is most convenient. On the top of the bank some shrubs should be planted, such as laurels, laurestinus, or rhododendrons. I prefer the latter in such a situation, for two reasons: first, because they may produce a few flowers in spring; and second, should they fail to flower they are much hardier than the before-mentioned plants, and therefore better able to stand rigorous winters. Stepping now inside of this embryo fernery we must commence to fit it for the reception of the new tenants. This bank of earth inside must have a quantity of burrs partially buried in and about it. Burrs are bricks which have been run together in the burning, and thus become useless for building purposes, and can be had very cheap in almost any locality where brick buildings are erected. If stone be the common material of the locality, then use blocks of stone. The outline of the bank must be undulating, so as to present bold, rocky points, and retiring bays wherein may repose some of the choicest species of this lovely race. If there is a wall to form one side or the back of this position, masses of burrs should be fastened upon it, or small pockets made with cement, for the reception of various plants, which, in addition to hiding its naked deformity, will add great beauty to the whole, and afford much additional pleasure. The centre portion, according to its size, should be laid out in beds, or if the space is small, a single bed will suffice, in a similar way to the boundary bank, by building up a mound of earth and burrs, always bearing in mind that e uneven and rugged in outline, the ffect it will have, and the more sur- produced for planting. Care must taken to leave sufficient crevices the burrs to insert the plants, and as many have done, make the rock- e principal object instead of the A few rustic logs may also be in with advantage, as they vary the d afford congenial homes for creep- ies, such as the Polypodium vulgare, rs of a like nature, whilst to accom- the Royal fern a hole should be sunk f the bays, so that it may have the of extra moisture which it so much in. If the amateur is desirous of ing the effect of tree ferns, it can be complished by procuring from those ort such things a few trunks which d on their passage to this country, nt in their tops some hardy fern, itish or exotic, according to fancy. eneral planting always observe that ies with surface creeping rhizomes nething genial to cling to, and that inds with underground spreading have sufficient space to spread thout becoming cramped, as such an ce could only ensure deformity. In of those with erect stems, more depth face-room will be necessary; but in position any of the plants are placed, that all superabundant water can apidly, for it is quite necessary to fact well in mind, that however much ight in water they cannot suffer it to their roots without receiving serious The soil should be loam, peat, or d and river-sand in equal parts.

nting a hardy Fernery it will be to diversify the ferns with a few oice plants which thrive well under onditions, such as the various species and North American orchids; also the Sarracenias, although these latter ire covering during winter; various of Equisetum are also adapted for ose, as well as Bambusa Metake and ther kinds; the genus Carex affords andsome forms which associate well with ferns, and a few Saxifrages and Sempervivums will afford a pleasing contrast. Many other things will suggest themselves to those who are interested in this subject, such as Arums, the autumn-flowering crocus, one or two varieties of Canna, and Aralia papyrifera, with some varieties of the small-leaved ivies. Whilst speaking of ivies, they form beautiful objects in a Fernery for rough arches, which may be made with burrs; or short columns may be built, against which ivies should be planted, many different kinds of which are to be obtained now very cheaply, some green, some variegated, but all beautiful, and all associate well in such a situation.

Up to the present time I have been working under the shade of large established trees; but it is quite possible some of my readers may wish to establish a Fernery in their garden and have no trees to afford them shelter; this, however, need form no serious obstacle, for it is a difficulty easily overcome by spanning the ground with a few iron rods, to which must be trained some plants of the Virginian creeper. This being a very fast grower will afford a nice shade during summer, and delight the eye in autumn with the vivid tints it assumes with decay. If a more permanent shade be preferred, some plants of the strong-growing varieties of ivies should be trained up the iron rods, and the Virginian creeper only used until the ivy is sufficiently advanced.

It is possible that some small gardens may have a small stream of water running through them. This is not often the case, but when it does occur should be taken advantage of in the construction of a Fernery, for not only would it be a more genial atmosphere for the ferns, but many very interesting aquatic plants could also be accommodated, and the scene rendered more picturesque.

I have not deemed it necessary to occupy space by an enumeration of names of ferns for this purpose, as it is well known all the British ferns with but one or two exceptions are perfectly adapted for such a Fernery in any part of the three kingdoms, and the names of the hardy exotic kinds are easily obtained.—*B. S. Williams, Upper Holloway.*

CONSTRUCTION OF HOT-BEDS.

THE most economical way of making hot-beds is to place the manure in pits. These are formed by excavating the earth about 3½ to 4 feet deep and of a width to suit the usual 6-foot sash, and of such length as may be required. The sides of the pit are boarded up, on the front or south side, to a height of 8 or 9 inches, and at the back or north side, some 6 inches higher, to give the necessary slope to carry off the water from the sashes and to better enable it to catch the sun's rays.

Thus formed, the frame will measure 3 feet deep from the sash in front and about 3½ feet at the back. Or, if the work is desired to be permanent, the sides may be built of brick instead of boards.

Above all other considerations, the place where the pit is built must be free from standing water, and if not naturally dry, must be drained so as to carry off the water. Whenever practicable, the situation should be warm and well sheltered, as such a position will save a great deal in winter covering.

The heating materials for hot-beds is usually horse-manure, but leaves from the woods, or tan-bark, will answer nearly as well when one is more readily attainable than another.

Whatever material is employed, it should be thrown into a heap of sufficient size to generate heat, and repeatedly turned until the rank heat has been expelled, which will usually be done by turning twice. The mass will be in the proper condition to be put into the pit in eight or ten days from the time of starting with the raw material. In spreading it in the pit it should be firmly trodden down to the depth of 18 inches, so that the heat may be longer retained. If the hot-bed is to be used for the sowing of annual or other seed, a covering of 6 inches of light soil should be put over the manure. Before placing plants or sowing seeds in the hot-bed, plunge a thermometer in the bed, and when the heat begins to *decline* from 100 deg. then operations may be begun with safety. But for whatever purpose a hot-bed is used, the bed should never be made before the first week in March; great risk is run if it is made much sooner, with but little advantage in earliness.

Greater caution is necessary in airing than with the ordinary cold frame, for with the hot-bed the heat from the manure, together with the sun's rays, will often run the temperature in an hour so high as to destroy its whole contents, if airing at the proper time has been neglected. Many a merchant doing business in the city has gone home in the evening to his small garden to find that his hot-bed, that had been his pride in the morning, had become a scorched brown mass at night, for want of attention to the safety-valve of "airing." In such cases, when no competent person is in charge, the safest way is to tilt the sashes a few inches, even before the necessity arises, rather than run the risk of the sun coming out too strong and destroying the whole. In a southern exposure, in a sheltered place, there is rarely danger in admitting air in most days, even in March or April, from 9 to 4 o'clock. But, of course, judgment must be used in extreme cases.

The greater heat in the hot-bed necessitates watering freely whenever the surface of the soil appears dry, which, in dry weather, if the heat is strong, will usually be every other day.—*P. H.*

ECONOMICAL EDGINGS FOR GARDEN WALKS.

NO. I.—THE RUSSIAN STRAWBERRY.

TO owners of small gardens, it is of the utmost importance that every avail- e portion of their ground be appropriated the growth of either useful or ornamental nts. And as in walk edgings there is haps more room for improvement in this pect, than there is in any other depart- nt, this is given as the commencement a series of short articles on the formation economical walk edgings, which it is ped may be useful to many of your readers re especially to those who, without think- for themselves, have been content to k upon dwarf boxwood, sea pink, grass, uble daisies, or other equally unremunera- e plants, as being alone suitable for forming arating lines between the gravelled and cultivated ground in their occupation.

The Russian or bush Alpine strawberries fer from all others of the race, in being a close compact bushy growth, and en- ely destitute of spreading runners; possess- in fact that denseness and neatness of bit which is essential in edging plants; ded to which they yield a continuous suc- sion of ripe fruit from the commencement the strawberry season till checked by the sts of ending autumn. As in the ordinary, runner-producing Alpine strawberries, there red and white varieties of the Russian, th of which are so similar to those of the mer, in size, form, and flavour, that they not easily distinguished when gathered. is in the estimation of many will be emed a great bar to their cultivation; for pine strawberries are now so much under- ed in Britain that but few grow them at , a neglect which is chiefly attributed to ir smallness of size, the proverb, "better all fish than none," not in their case ing allowed to hold good. Although they ght be had in abundance long after the ger kinds are done, this valuable pro- rty is too generally unheeded. On the Continent they are far more highly and justly appreciated; for all travellers extol the rich and fresh wild Alpine strawberries gathered for them when visiting the Swiss mountains; and only a few years have passed since we heard an eminent French nurseryman characterizing the English strawberries as being beautiful to look at, but vastly behind their cultivated Alpines in richness of flavour. Of these they have some improved varieties which commend themselves to a few home growers who desiderate an occasional dish of good, though small, strawberries throughout October and the first weeks of November; but even these are scarcely superior to the bush Alpines, for which we can at least depend upon always receiving a favourable verdict from youngsters; and few older folks but will feel gratified at the sight of young children eagerly searching for the leaf hidden berries.

Division of the plants is the only mode of propagating the Russian strawberries, besides rearing them from seed; and such is their productiveness in offsets that a two-year-old plant will frequently divide into three or four dozen, so that they are as easily increased as those that reproduce themselves by runners. If planted for edgings early in spring, they will fruit freely through the succeeding summer and autumn; but if planted in August or sufficiently early in September to allow of their being fully established before winter, larger crops will be produced in the following year, than when the planting is deferred till spring. They may be planted at from 4 to 6 inches apart, and need not be removed oftener than every third or fourth year. If the first flower stalks be all cut off as soon as they appear, so as to dispense with the first crop, additional strength will be thereby imparted to the successive growths, and consequently better autumn crops will be produced.—*William Gorrie, Trinity, N.B.*

WHAT FLOWERS WILL GROW IN THE SHADE?

THE question "What flowers will grow in the shade?" is put to me every spring by scores of city people, whose little patch which they wish to devote to flowers is so walled up by neighbouring houses, that the direct rays of the sun, never touch it. But few plants will develop their flowers there, and none will do it as well as if it were lighted up by sunshine a part of the day. Fuchsias, pansies, forget-me-nots, violets, lobelias, lily of the valley, phloxes, and other herbaceous plants whose native habitat is shady woods, will do best, but even these languish if denied all direct sunlight. The best effect in such situations is produced by ornamental-leaved plants, the beauty of which is not dependent upon their flowers. Among these may be ranked the gold and silver variegated leaved geraniums, Achyranthes, Alternantheras, Begonias, Caladiums, Centaureas, Coleuses, &c., which, if planted so as to bring the various shades in contrast, produce a pleasing effect, which continues during the entire summer months, and is not surpassed by any display of flowers.

The cultivator of flowers in rooms should understand the necessity of sunlight to plants that are to flower, and endeavour to get these as close as possible to a window having an eastern or southern aspect. The higher the temperature, the more plants suffer for want of light. Many plants might remain in a temperature of 40 degrees, in a cellar for example, away from direct light for months without material injury, [illegible] the cellar contained a furnace keeping a temperature of 70 degrees, they would all die; such would particularly be the case with plants of a half hardy nature, such as monthly roses, carnations, fuchsias, &c.

In our green-house culture of flowers, direct sunlight is an all important consideration; and a spell of sunless weather in mid-winter is often a loss to nurserymen of many pounds, by preventing the development of flowers. Hence, they use every means at command to dispose the plants to secure the greatest amount of light.

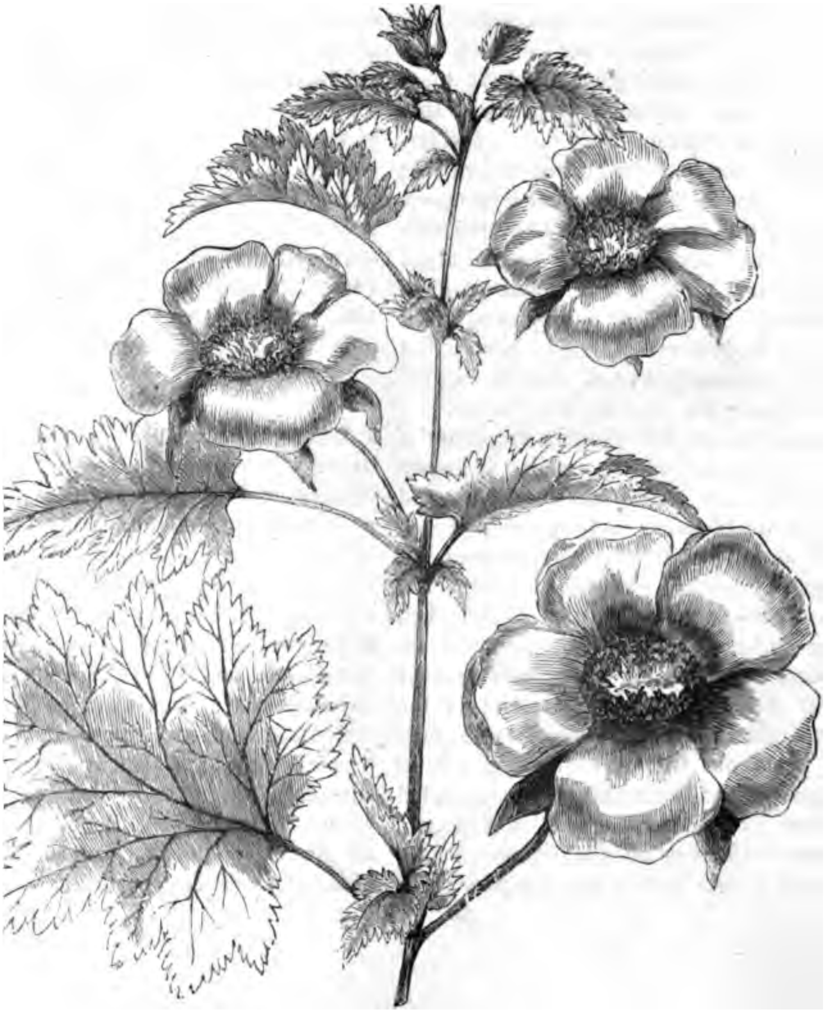
The debilitating effects of want of direct light on plants are well illustrated by taking a vigorous plant in full foliage and flower, that has been growing in the direct light of our greenhouse shelves, and placing it under the shelves. If the temperature is high—say 70 degrees, in 48 hours the sickly signs, shewing want of light, will be apparent to an experienced eye; in a week its condition would be such, as to indicate sickness to the most common observer; and in a month it would most likely be dead.

In this respect, there is some analogy between plant and animal life, and it teaches us the importance of light for our own healthy development. Certain it is that our greenhouse and garden operatives will compare favourably with any other class of workman, as far as health is concerned. I doubt if it would be easy to find the same number of workmen employed *out of the sunlight*, who would shew such health.—*Peter Henderson.*

NEW AND RARE PLANTS.

RUBUS DELICIOSUS (Torrey),
DELICIOUS FRUITED RASPBERRY.

IOUGH more than thirty years have psed since this highly interesting and shrub was discovered by Dr James ocky Mountains of North America, at. 41 deg., we are not aware of flowered in Europe till in May 1869, it bloomed first in the garden of our correspondent, Mr W. Gorrie, and in a few days afterwards in that of Mr I. Anderson Henry, both at Trinity, in the vicinity of Edinburgh. In May of the present year, these plants were abundantly clothed wit snowy white flowers, each averaging fully 2¼ inches in diameter, and resembling very m



Rubus deliciosus—natural size.

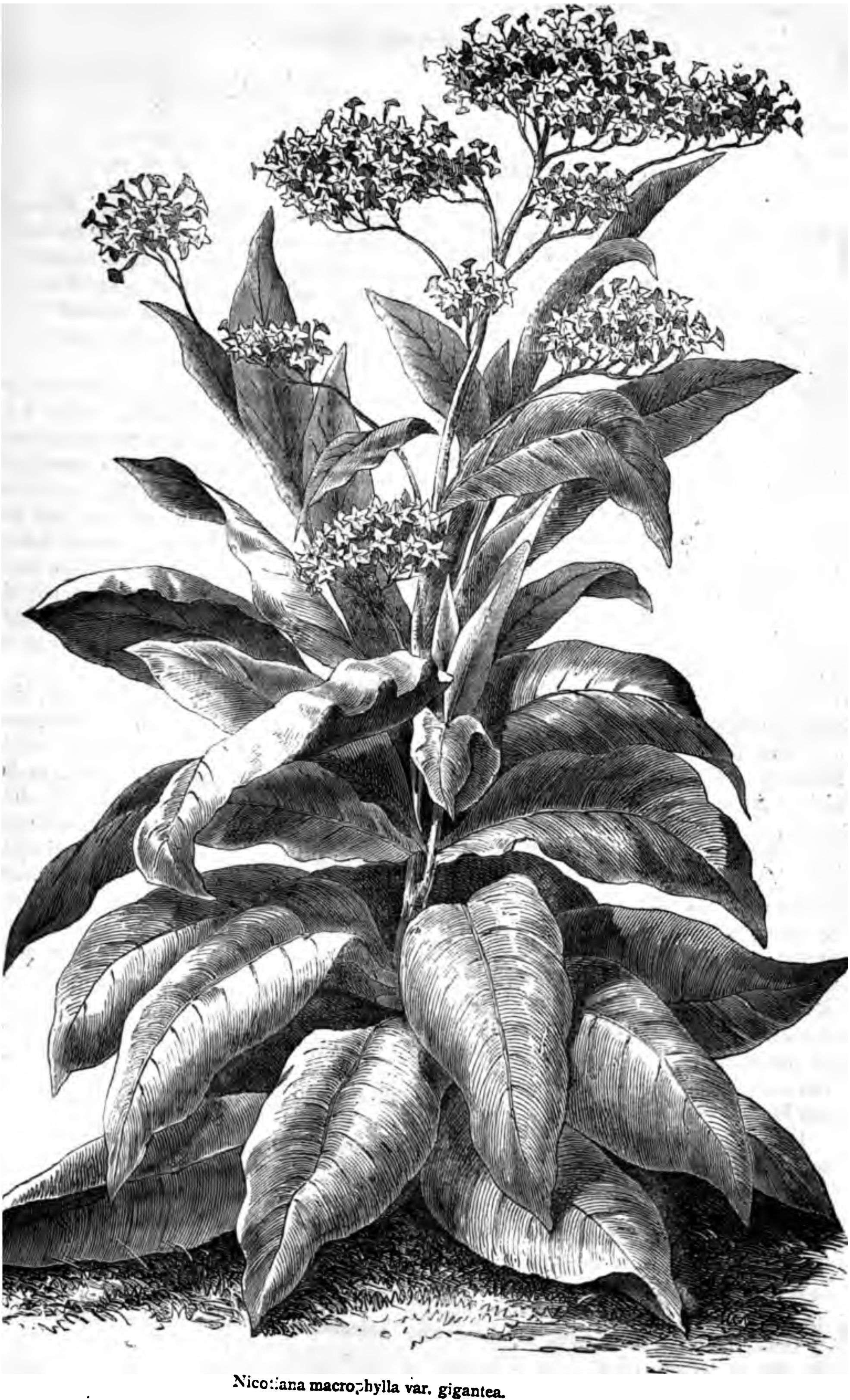
those of the wild Scotch rose, or the white dog-brier. The fruit Dr James describes as being large and delicious, but none have hitherto been perfected on either of the plants mentioned, although a few of their flowers were followed by imperfect berries, which withered up before ripening. Unlike the common raspberry and blackberry or bramble, which have two-year enduring, or biennial, shoots, those of this species are perennial, strong branchless ones being annually sent up from the root or stock of the bush, which branch out in the next and succeeding seasons, carrying a single flower at each bud or joint, and becoming gracefully bent down under their loads of bloom and pretty foliage. In general appearance they bear considerable appearance to brier bushes, except that they are without thorns, and more compact in habit, as well as more thickly covered with flowers; which coming in the end of April and beginning of May, long before those of the "bonny brier bushes" or dog-roses, which adorn our hedges and waysides, cannot but prove highly attractive to all who are capable of appreciating the beauties of the latter.

In regard to the fruit-yielding properties of the R. deliciosus little or nothing is known beyond what Dr James has recorded; and although its blossoms have hitherto proved almost abortive in this country, it does not follow that this defect may not be overcome, as has been done with other exotics, such as the Berberis dulcis, which, when first introduced into Europe, was almost entirely barren. Of this we lately saw one of the original plants, which, although more than forty years old and exceeding ten feet in height as well as in diameter, scarcely yielded as many as a dozen berries in a season, or fe[illegible] hang on single twigs of four- [illegible]ngside; and which were the offspring of repeated semina reproductions, by which they had become thus thoroughly acclimatized.

To hybridizers the R. deliciosus presents an interesting subject for experiment; and of the species most likely to amalgamate with it, those with reddish-coloured flowers are the R. spectabilis or salmon berry; R. odoratus, the Virginian raspberry; and that most northern of edible fruits, the R. arcticus: and of those with whitish flowers may be mentioned the Cape berry, R. nutkanus; and R. Chamæmorus, the grateful cloudberry or avron of our higher mountain peat-bogs, which although diminutive in growth, and scarcely shrubby, possesses other characteristics that make it one of its nearest allies. Our engraving was taken from Mr Gorrie's plant; and in proof of the vitality of the seeds, it may be mentioned that a few of those that were collected on the Rocky Mountains in 1866, and had been kept over till March 1869, came up freely last spring, after lying in the earth for a twelvemonth.

NICOTIANA MACROPHYLLA, *var.* GIGANTEA.

In a recent number we gave some directions to our lady readers relative to the growth of tobacco in their gardens, as a pleasing surprise to those who had husbands, brothers, or lovers who indulged in the "vile weed." Here now is a variety of the tobacco plant which besides being highly ornamental in the flower garden furnishes a very superior quality of tobacco, and is, in Germany preferred to any other kind. It grows to the height of four or five feet; and, being crowned with beautiful purple flowers, it is a plant which may with great advantage be grown in beds or in isolated groups. Messrs Dick Radclyffe & Co., we are given to understand, are the sole holders of the stock of seed.



Nicotiana macrophylla var. gigantea.

SOMETHING ABOUT ORCHIDS.

THE number of varieties now in cultivation is so very extensive, that in speaking of them individually I must necessarily confine myself to a few of the most popular, and the most likely to succeed in establishments where there are no special appliances for their benefit; and amongst these it is a matter of doubt as to which should occupy the place of honour, when Dendrobiums, Cattleyas, Lœlias, Odontoglossums, &c., are brought into competition. As a rule the bulk of these are of comparatively easy culture, though there are varieties amongst each of them which to this day perplex many of our best growers. Amongst Dendrobes the old nobile still holds its place as one of the most useful and beautiful; and, taking it all in all, may be considered one of the best in the family. It has, however, many lovely competitors, though most of them are behind it in one point or another; Devonianum, Falconerii, and Wardianum being more difficult to grow, as well as being more costly, while the varieties of Farmerii, densiflorum, fimbriatum, &c., though in the beauty of their flowers superb, lack some of the others quality of persistency. To gain a good crop of blossoms from Dendrobiums, the chief aim of the grower should be to have the growths made as early in the season as possible, so as that all should become thoroughly ripened ere the short dull days; and it should be observed that during the season of rest, this class bears drier treatment than almost any other orchid.

It is a noteworthy feature in many of the members of the orchid family that, when not in flower, owing to the peculiar style of growth, they present a somewhat stiff and uninteresting appearance. No doubt this defect in foliage is, in the eyes of many, a serious detraction, and it is one under which the Cattleya tribe labour in a marked degree. I think, however, that most of those who object to them on this ground will, during the flowering season, lay aside the feeling, or rather exchange it for one of unbounded admiration, and will agree in according to the Cattleya a place of honour amongst the fairest gems with which Flora has rewarded the worshippers at her shrine.

Of the Cattleya family, we cannot have a better type than the old Mossiæa, and of it I would speak in much the same terms as Dendrobium nobile, C. labiata, Skinnerii, amethystina, maxima, and Triænea, and all varieties requiring little more than ordinary care in their cultivation—maxima and Triænea being valuable as autumn and winter-flowering varieties, while Dowiana, Warnerii, Exoniensis, &c., represent the more rare and valuable, and are, at the same time, deservedly reckoned amongst the most beautiful.

Lælias are nearly allied to Cattleyas, and like them may be grown with a moderate amount of heat and moisture, each of which essentials may be gradually diminished, as the plants sink into their quiescent state. L. elegans purpurata and crispa may be considered amongst the best for summer flowering; while for autumn and winter blooming, autumnalis, anceps, superbiens, &c., are amongst the most useful of orchids.

The Oncidium family also comprises many gems, where a supply of cut flowers is an object. In character, the numbers occupy a very wide range; and although the prevailing colour of the family is yellow, there is enough diversity to be found amongst them to make out a good claim to a fair share of admiration. O. altissimum, sphacelatum, and flexuosum are amongst the most common, and, as it is often enough proved, do very well in an ordinary stove; while aurosum, leucochilum, incurvum, and the rare macranthum, are varieties which do well in a much cooler atmosphere, incurvum being peculiarly valuable on account of the pink and white colour of its flowers, which, in mass, produce a very chaste and pleasing effect, and it is one of the most useful of orchids to cut from.

All things considered, the class of orchids which, to my mind, is likely eventually to receive the most extended cultivation, is that of Odontoglossum, and well do the sorts deserve the large amount of preference with which they are being received. Among them are to be found some of the most lovely objects in nature; and so wide do they range in character, that they are able to please every shade of taste, however varied. In variety, they are becoming very numerous, and are amongst the most easily managed of orchids, taking them generally, though there are a few varieties amongst them more difficult to grow than others, their principal requirements appearing to be, a cool shady house, and a bounteous supply of atmospheric moisture, so that none need be deterred from attempting their cultivation from fear on that point. All who have seen such varieties as Alexandræ, grande, Pescatorea, Phalænopsis, &c., will agree with me that it is hardly possible to extol their beauty too highly; and a good proof of their usefulness may be found in the fact, that where a few plants of each variety are grown, with a little management they can be had in flower the greater part of the year; and, like most other imported orchids, which have sprung from seeds sown spontaneously, two plants are seldom to be found exactly alike in variety; and thus they are vested with an interest which, to those who are able to apply themselves to their study, is increasing.

Many other species of this wide-spread family might be noticed to advantage, but to do so would, I am afraid, extend this paper to a length which would scarcely be expedient; so I will content myself with naming a few varieties, which any one might select from without danger of disappointment, and which will always be found deserving of the extra amount of care which may be bestowed upon them.

- Barkeria Skinneri
    - spectabilis
- Calanthe vestita rubra
- ,, ,, lutea
- Veitchii
- Cœlongyne cristata
- Cypripedium villosum
    - barbatum
- Epidendrum dichromum
    - rhizophorum
    - vitellinum
- Lycaste Skinnerii
- Maxillaria venusta
- Mesospinidium sanguineum
- Miltonia candida
- Miltonia Clowesii
    - spectabilis
    - Morelliana
- Odontoglossum citrosmum
    - ,, roseum
    - cordatum
    - luteo-purpureum
    - nebulosum
    - triumphans
- Oncidium bicallosum
    - cruentum
    - obryzatum
    - ornithorynchum
- Sobralia macrantha
- Trichopilia sauvis
- Zygopetalum Mackayii

SEED SOWING IN INDIA.

SEEING that there has already been some remarks made on the acclimatization of English vegetables in India, a few on another subject of scarcely less importance—much more so, indeed, to many, viz., seed-sowing—may not be altogether out of place. All who can afford it purchase imported seeds, either English or American; those from London or New York are generally preferred, because they germinate best and are of superior quality. I have sown seeds from Dublin, Paris, Edinburgh, &c., but never found any superior, if equal, to the New York ones. And considering that these seeds are never less than two years old at the time of sowing, failure, either partial or general, is a circumstance not altogether surprising. They fail, not because the seeds themselves are invariably bad, but on account of improper treatment, either before or immediately after sowing. Steeping the larger kinds previous to, and flooding the ground after the smaller kinds are sown, is a general practice. New seeds, could such be had, might not be at all injured by such treatment, but quite otherwise when seeds are a little old. But new ones cannot be had for this reason: at the time people in India begin to put in their crops, say for 1870-71, many of the seeds required are not then ripe. The first sowings of cauliflower, cabbage [illegible] during August and September [illegible] have new seeds [illegible] required [illegible] July [illegible] [illegible] try [illegible] affected [illegible] atmosphere seems to be quite as injurious to their vitality as it is to that of the strangers who use them. However, as before remarked, seeds oftener fail from improper management at the time of sowing than from decreased vitality. The practice of steeping some kinds previous to, and flooding the ground immediately after sowing others, is, so far as my experience goes, highly injurious. In not a few instances that have come under observation, such a practice has had the effect of killing them outright. I have oftener than once, by way of experiment, sown the half of a packet and watered immediately after, and the result was that, in most instances, not a single seed germinated. The remaining half of the packet has been sown in ground neither damp nor dry, but if anything on the dry side, and the result was as fine a braird as any one could wish to see. The practice of steeping or watering old seeds immediately after sowing seems to affect them in a manner analogous to that in which a hearty dinner of roast beef and plum-pudding would a man in the last stage of starvation; vitality is so much reduced that the food taken can neither be digested nor assimilated. The character or the symptoms that would follow such a mistake I do not exactly know; however, everyone knows the result they culminate in; what in an ordinary state of health would have done him good, in that kills him outright. In the case of seeds neither can I say aught regarding the character of the changes that occur after copious watering when vitality is low, but the results are invariably bad. Even in instances where the mortality may not have been general, the survivors never look so vigorous and health those that are allowed to germinate slowl Acclimatized seeds, it is said, seldom fa der such treatment, but the difference sufficiently accounts for the differe sults—they are never more than one ye old, those above spoken of never less tha two. Acclimatizers are a little fond of comparing and contrasting the high degree vitality possessed by those products of the genius and industry with the low degree possessed by the imported article; and, leavin age altogether out of consideration, such comparison is vastly in their favour. Let the Sahib be as particular as he may in giving instructions regarding treatment of the newly-sown seeds, the instant his back is turned ten to one but Hurlall does what he has been expressly forbidden to do, imagines the Sahib does not know quite so much about the matter as he does, then he is tolerably good-natured and won't say much. Hence the outcry is bad seeds, whereas the true verdict would be, "seeds moderately good, but badly treated."

If the ground has been properly prepared, and in a proper state as regards moisture at the time of sowing, vegetable seeds ought not to receive a drop of water until they shew themselves above ground. Cauliflower, cabbage, &c., after sowing ought to be shaded during the day until they are fairly up. Some one not acquainted with the customs in India may remark, Why always flood the ground when dry, why not use the watering-pan? That is an implement all but unknown in Indian gardens. In some aristocratic establishments they may chance to have a something which may pass as an apology for one, and is on some occasions used, but not regularly. The water-carrier's mussuck, or else the common gurrah, are the generally recognised implements for giving water, either in small or large quantities, and the plan of giving water with either one or other is in no respect better than that already condemned.

I am aware that in condemning the practice of steeping previous to sowing, or watering immediately after, I condemn what some of long experience strongly recommend. However, the term experience is a somewhat loose one, and may have more than one meaning. That kind of knowledge which is the result of careful, painstaking, and accurate observation, or that other kind which is the result of hasty inaccurate observation and crude supposition, are both alike claimed by their possessors as the results of experience—the one trustworthy and useful, the other deceptive and worthless. A great deal of that generally known as Indian experience, and highly valued by some, consists entirely of the latter.—*B. K.*

USEFUL GARDEN ARTICLES.

FUMIGATORS.

If any of our readers were to ask us which is the most effective Fumigator of the present time without tying us down with any conditions as to first cost, for instance, then we would unhesitatingly give the preference to Dean's. As a smoke-producing medium it has not a single equal, and we have tested several of them.

The old fashion of blowing away with hand-bellows was a nuisance to all immediately engaged; but for want of a better it had to be submitted to. Where large plant houses had to be fumigated, it was not many men that were equal to the task of endurance in statedly doing the work; and the time necessary for completely filling the atmosphere within with fumes was prolonged.

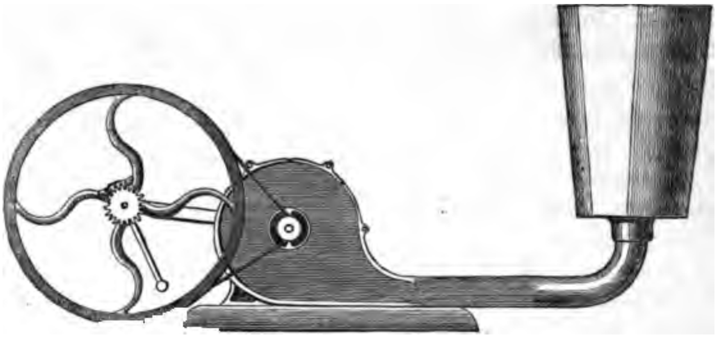


Fig. 1.—Dean's Patent Fumigator.

Add[illegible] the paper a-blaz[illegible] such mis[illegible] [illegible] remunerative, he has [illegible] patented his invention, and we [illegible] no doubt but in time it will supersede [illegible] of those [illegible]

The principal details of this fumigator are, the hopper for holding the tobacco or tobacco paper, which, as fig. 1 shews, is connected by a tube, at the termination of which is the receptacle for a set of revolving fanners, for the purpose of disturbing the air and fanning the embers in the hopper. These fanners are again fitted to a small roller, to which the large wheel handle and fittings are connected by a rope, rendering the operation simple and complete. Any one can fill a very large house in a very short time with this fumigator, the fumes being emitted in dense volumes, equal to the diameter of the hopper. The hoppers sent with the fumigator are large enough for our villa gardens; but for more extensive places it is an advantage to both lengthen and widen them, for the purpose of containing a larger quantity of prepared paper, and for accelerating the work.

[illegible] though first cost may be a consideration with some, it must be understood that the workmanship is thoroughly substantial, and consequently the duration of the article is [illegible]d.

[illegible] an object with many to have a fumigator to do the work in-doors, while the party operating remains out-of-doors. This is quite practicable by unfastening the hopper from the tube of the fumigator, provided there is an aperture to insert the tube. We n this as more a nominal than a real e, as it is exceedingly desirable for o see and feel what is going on in sphere of the house in process of nigated. Moreover, a house can be more uniformly by beginning at one moving doorwards, than by attempt- it from any given spot. All things d, we prefer recommending the dis- of five minutes to reap something and satisfactory, than run the risk e and uncertain results.

's FUMIGATOR is more adapted for binets, Wardian cases, and small ses, than Dean's. It is quite a t of implement, working very much same principle; more slow in its , certainly, but infinitely more pre- the ordinary mode of pot and bel- ve taken notice of. It is purely a for the operator remaining outside ng the handle, to force the smoke small tube inserted into the limited re. We prefer it to Drechsler's lthough both answer the purpose gh, and either would do well in the nd for the special work we recom-

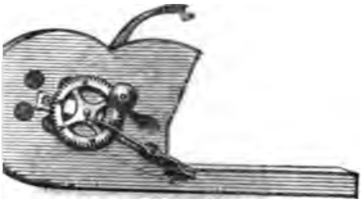


Fig. 2.—Brown's Fumigator.

PATENT FRUIT GATHERER.

are in another part of this issue y excellent remarks upon the gather- nit, which cannot fail to arrest the of the reader. It is to be hoped l arrest the attention of the careless who often is so indifferent as to how eds that many bushels of good apples s are destroyed. Apples ought to lly gathered, and as carefully bas- if they were so many eggs. Rough in the matter of eggs shews itself at once by total destruction; rough treatment in the matter of pulling and storing fruit is not seen for days and probably weeks. But if it tell in time, on the bruise becoming black, in the fungus cysts extending themselves until, as is well said in the paper already noticed, not only the individuals affected at the time, but those that come in contact with them, run the risk of being destroyed. Now the first help for the gatherer who has to pull any fruit from large trees is the useful little implement shewn in our engraving. It is fitted with the beak-like article for catching the fruit, and the net basket for receiving it when separated from the bough. The long handle enables the party gathering to reach up to the height of almost any full-grown orchard tree; and the article that does the pulling, or rather that envelopes the apple, is connected with a small rope which can be pulled so as to receive the largest fruit and allow it to fall into the network receptacle. We beg to call all our interested readers' attention to it, at this season, and during this month, when so much gathering is going on. Equal care, recollect, is necessary for storing. Not the semblance of a fall is permissible—no noise in fact ought to be heard while placing them upon the conserving shelves.

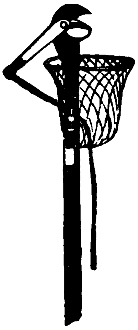


Fig. 3.

THE ABERCORN COMBINED CHAIR AND STEPS.

One of the really useful articles of furniture about a greenhouse or plant-house of any description, is what is called the Abercorn Chair. It is not only useful indoors for the convenience of reaching suspended plants and resting occasionally as desired; but out-of-doors about a garden, whether for pulling fruit from standard or wall-trees, or for reaching to correct the boughs of ornamental trees with a knife, or for any purpose beyond the reach of a party on *terra firma*, a pair of steps of some kind is in request. But we have been so accustomed to storing up our steps in the tool-house as an article unfit to be seen, and only called out when absolutely necessary, that its usefulness has been somewhat depreciated, and a great number of people therefore did not think it an absolutely necessary article to buy. Now, however, that it is made to serve the twofold purpose of increasing the height and offering repose to the body at will, the public generally only require to know to appreciate and buy. The novice in matters of this kind would be apt to consider an article of the kind, hinged and fitted in the way it must be to serve the purpose, not substantial. It really, however, is so. It is made of the best red deal generally, and varnished, quite fitting it for a position in the finest conservatories as well as for library, surgery, warehouse of any kind, or, as recommended above, for general purposes out of doors. Fig. 4 shews it as a chair. By turning the back of the chair down over the front it is so hinged and arranged as to form the steps, as in fig. 5. There are several varieties of it now in use, but that figured from Elliot & Co's establishment in Manchester, is as good [illegible] With the illustrations and our remarks [illegible] ility of [illegible] and we cordially [illegible]

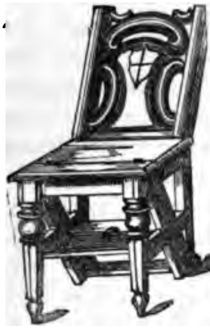


Fig. 4.

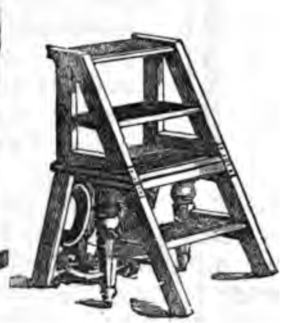


Fig. 5.

[illegible]

[illegible] elegant and yet simple [illegible] o[illegible] stand for the lawn. The frame-work is of iron; and all the upright bars being moveable, it can be readily taken to pieces and stored when the season for flowering plants is over. To prepare it for use, cut some sods of fine turf, and line the inside, the grass being to the outside. Then fill in with soil and plant with suitable flowers, or plunge the pots in which the plants have been already grown. The latter plan is the best, as it enables you to keep up a succession of flowering plants during the season. Figs. 6, 7, and 8 represent three forms of the Leicester Flower Vase.

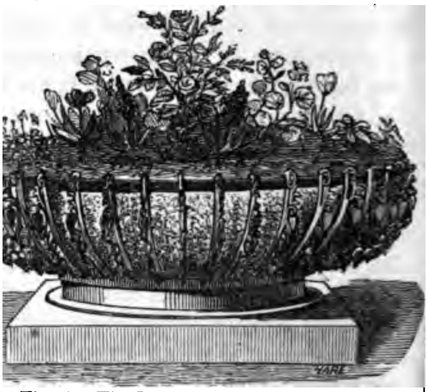


Fig. 6.—The Leicester Flower Vase.

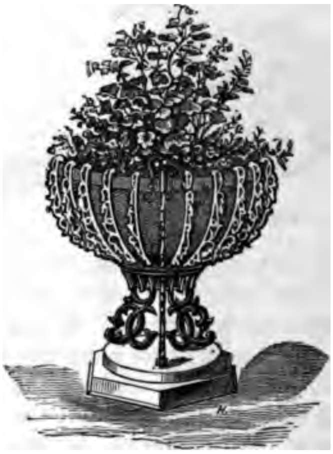


Fig. 7.

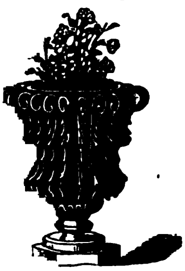


Fig. 8.

THE CHATSWORTH CONDUIT EDGING TILE.

NG novelties for simplifying the outine work of any well-managed is what might be called an econo- vater-trap, the joint production of Ayres and Speed. Looking to the logical tables published of rainfall out Great Britain, and the fluctuating of its distribution, we see more and he necessity of encouraging an un- lness of one of the greatest boons ed to both man and beast. Mr , in the introduction to his valuable points out the absolute necessity of ion or those in power, giving an un- attention to the history of rainfall; om the observations placed at his l, he is fully warranted in doing so. know of the partial distribution of oughout the United Kingdom, how istricts are in a manner flooded, and rs scarcity prevails; but it is only by l observations, year after year, that in a position to strike averages, and latter times we find a considerable off. This, doubtless, is due in a to the extensive drainage operations e been going on where an excess of drained into arteries which carry it yond the reach of utilization. There other circumstances at work influenc- prevailing state of things which we ussing, but of that in the meantime no notice. Sufficient to know that often in demand where it can be ill l, and if supplied at all at considerable Ve therefore hail any plan likely to ize what is presented to us from the if not attended with too much ex- Running streams are not always to contiguous to gardens, and even wells gs of water are quickly used up easons of drought. In looking about uxiliary, the gentlemen above named idently considered what a large supply r can be collected from a surface of glass into the various reservoirs, cisterns, and barrels; and hence, they not inconsistently demand that the garden walks should be made to furnish their quota as well. Happy thought! Why has it been so long concealed? Conservatories and glass-houses generally, are but of limited area in comparison to walks, and yet the water furnished from such, and from dwelling-houses, is considerable. Call into aid the walks, and have conduits and tanks, and the water supply can scarcely ever fail. A garden laid out on the plan proposed (see fig. 1), will have its tanks (marked by circles in the figure) for attaching the hose, or dipping the water-pan, at nearly as convenient points as a conservatory, and the gain to the growth of vegetables must be obvious at a glance. Moreover, the fruit trees will get refreshers oftener than was wont, and we shall have less complaints about caterpillars, and mildew, and fly. Over and above all this, box edgings will be saved the annual cost of clipping, and keep will be saved also; and there will be utility, convenience, and a uniform degree of order, which must commend itself to every one. The little addi-

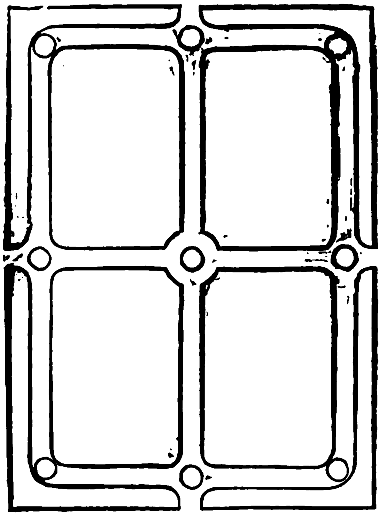


Fig. 1.—Plan of Garden, shewing Tanks.

tional expense at first will mainly consist in the formation of the tanks. The edging tile and the tile conduits may be calculated as a set-off to first cost and annual keep of one or other edgings. True, the walks will require to be more carefully made, so that water may run from centre to sides and not be percolating the gravel, as we often see in moderate rains. A cheap concrete will do all this, and once a thing is well done—always done—it has permanency about it.

We annex the following particulars given by the designers which, along with the aid of the engravings, will make the whole matter clear and plain to all who are desirous of knowing.

It will be seen that this invention consists of an edging tile and water conduit in combination (fig. 2, 3, and 4), the conduit having a slot along the top, into which the tile fits, and is held in its place by means of a small quantity of cement, introduced at intervals at the time of fixing, and leaving crevices through which the water finds its way into the conduit, and thence provided to receive it.

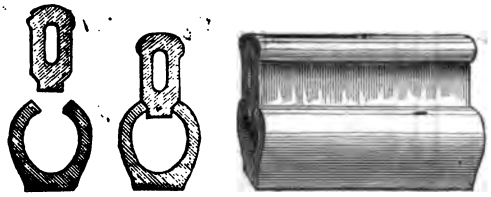


Fig. 2. Fi Fig. 4.
Edging Tiles—Sections and Elevation.

By the section of the tank sl engraving (fig. 5) it will be ob the garden walk completely cov duit, which receives the rain-wat upon the walk, and conveys it t The supply hose of the garden troduced at the centre pipe D the requisite supply of water thi At B is shewn the end of a con pipe, through which, when the tar waste water passes from the hig lowest part of the garden, and tl main drain. The inside of tank A; at C is the edging tile and con E shews the concrete walk.

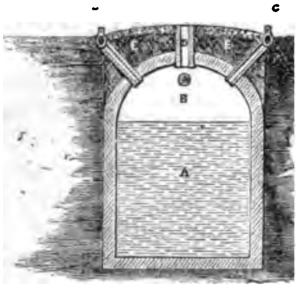


Fig. 5.—Section of Tank in connexic Edging Tile.

By this means a garden may b watered with far less labour than nary methods; and, if desired, a tity of guano put into the tanks wi supply of liquid manure for imme

Work in the Garden during October.

From "THE VILLA GARDENER."

rtening days remind us to redeem the
How rapidly they creep in at both ends !
l evening labours must soon cease. The
wanting. Villa gardening in the short
done under difficulties. At this season,
s apt to cool down to zero. Gardening
ng pastime in summer. The glory of
nd setting sun, the melody of birds,
f women, the beauty and fragrance of
uits : all these, and many other influences,
s to the garden in summer. But now
adventitious aids to gardening pursuits
ne by one, removed. "Passing away,"
deep lines across the fair face of garden
xurious summer airs are being chilled
arshness ; the hum of insects and the
ds, are alike silent. Summer zephyrs are
harsh loud winds, which seem to chant
l burial of summer beauty, in some such
se :—

, oh ! ye autumn winds !
Summer has fled,
owers have closed their tender leaves and
die ;
The lily's gracious head
All low must lie,
se the gentle summer now is dead.

oh ! ye autumn winds !
She loves no more
entle summer with her balmy breath,
Still sweeter than before,
When nearer death,
righter every day the smile she wore.

gardening at all seasons, we must drink
of these last lines. Hopeful hearts and
will always find plenty to do and much
he garden. It is full of the wonderful
e. The plants are not dead, only asleep.
it that they are tucked in neatly and
ath their coverlets of earth, until they
They are only resting to recruit their
t us use this respite to lay in fresh and
res of food for their exhausting labours.
w gathered themselves together within
t limits. Now is the time to transport
aces where they are not wanted, to others
are. They have thrown aside their
eaf and flower, and revealed their true size and form. This is the season to mould them into shape and set bounds to their dimensions. Some have left the ground for a time ; let us make haste to deepen, dry, and enrich it for them before they come back again. Their great house, the earth, may be ungainly in form, inconvenient, or unsuitable. Now is the season for remodelling, reshaping, or even rebuilding, their earthly habitations. The flowers were sweet and beautiful, but their company was ungenial or incongruous. This is the opportunity, which, taken at the flood, will furnish better accompaniments in the form of choicer shrubs or trees, greener turf, cleaner, brighter, drier gravel. Amid all these labours we will forget the disagreeable side of gardening, if it has one. In my mind's eye I see the charming Mrs George Merchant Prince, in warm stuff gown and thick waterproof boots, encouraging George with counsel and help, at Mentone Villa, looking all the more lovely for the bracing wind and the keen air. A friend has just sent them, it would seem, another load of stones, and they are busy with spade and barrow, the willing hand and the flashing eyes of genius extending their fernery. Both are laughing merrily, and seem to think the work cheerful play, capital exercise. And Mr and Mrs Prince are but types of thousands who never tire nor rest from garden labour, summer nor winter. Even the iron fetters of frost, which puts the seal of impenetrability on the earth, only lightens the friction of the wheelbarrow, as it bears its burdens of replenishment over the land. Not only hath every season its peculiar beauty, but its special work ; and much of the wor for the winter is of a character to suit the season Wheeling, digging, draining, manuring, alteration o form or of place, and even pruning, will keep one comfortably warm in the coldest days. The removal of snow from the gravel and grass is a source of pleasure and amusement. It should be wholly removed off all walks in villa gardens. The walks will thus always be clear and ever dry for use. October seldom brings winter; it is but its harbinger. It finds us unready, it ought to leave us prepared, for the frost. Autumn vintages must be gathered in; summer beauty, if possible preserved, and winter and spring largely provided for during the month.

KITCHEN GARDEN.

During this month, most of the root crops, such as *Carrots*, *Beet*, *Parsnips*, are taken up and stored, This ought to be done carefully, with the assistance of forks, so as not to injure the roots. Every wound and bruise lays the foundation for rottenness and premature decay. It is especially necessary not to wound beetroot, as the sap will ooze out and drain the roots almost [dry of juice and clear of colour. Some prefer leaving parsnips in the ground till wanted. This preserves their flavour, and keeps them fresh and firm. But it interferes considerably with winter cultivation. Where the plan is adopted, the best mode of treating the soil so as to minimize the injury of storing the roots in it, is to fork up the earth among the crop as roughly and deeply as possible, without injuring the crowns. The weather will then mellow the earth down, as if it had been dug.

But the tidiest and the handiest plan, especially in all small gardens, is to take up all such crops during the month, and store them in heaps, pits, or cellars, in earth. Too many must not be laid up together, else fermentation might be induced, which would ruin all. Choose a dry day, if possible, for harvesting all root crops. Place them in single layers, with layers of earth alternately between them, and exclude frost from carrots, turnips, beet, &c. Some people think the frost improves parsnips : they will bear it with comparative impunity. Carrots, on the contrary, are ruined by frost. Writing of the effect of frost upon vegetables, reminds me of how very capricious taste is occasionally in such matters. I have heard of a lady, who was so fond of frosted potatoes, that her daily supply was always set out, in the hardest frosts, for a few hours before they were used, in order to get sweetened. She always declared, that while others thought sugar dear, her potatoes were at least sweetened for nothing. This was a taste that was not likely to spread, though the lady herself wondered at the folly of the world preferring unfrosted, that is unsweetened, potatoes. The main army of the king of vegetables must get into its winter quarters during the month, and on no account must be exposed to a frosty air unprotected.

Potatoes will stand several degrees of frost when safely covered over with earth. Even if frozen through under ground, they will recover if let alone. But many potatoes have been ruined by being exposed to one degree of frost in the air. Taking potatoes out of the soil and laying them in the teeth of an arctic blast, is like stripping a man's clothes off and sending him abroad naked. The potato catches cold as soon as the man would; in fact there is nothing worse for potatoes than exposure to the air. Out of the sun, into the earth, should be the motto during potato harvesting. Even when no frosty air is abroad, the free atmosphere steals away their choice juices and lowers their quality. It is this early exposure to the air, as much or more than anything, that makes all the difference between potatoes newly lifted and others. [illegible] the potatoes, as soon as taken up, with earth, [illegible] them in small quantities to ensure first-rate quality. If by any means they heat, farewell to freshness and sweetness of flavour. The earth used for mixing with potatoes must be fresh garden earth. I have seen the same earth used a second time, and dry sand employed for this purpose. Better substances could not have been used for imparting a nasty taste, and for robbing these noble tubers of their delicious juices.

As a matter of convenience, straw is often placed over potatoes to keep the earth apart from them. It saves labour in taking them from the pit, but it has no other recommendation. If it is used, it ought to be the sweetest and best. Few things take a taint sooner than potatoes. Earth, in a medium state of moisture, husbands the juice and preserves the quality of potatoes. And if additional protection is needed to exclude, let it be put on outside the earthy covering, and not inside.

Having stored all the root crops, proceed to prepare the *Brocoli* for enduring the winter and spring frost. Most of the later varieties will now be in full and fine growth. And herein lies a danger. Rankness and tenderness are synonymous, as the frost will prove to our cost by-and-bye, if we leave these strong brocoli plants alone. But we want you to profit by the experience of others, and be wise in time. These plants must receive a check, that they may be hardened. There are several ways of checking them. Some take them up with as much ball as they can get to adhere to them, and replant them, roots and stems and all, up to the top leaves—in fact, lay them in as they would do kale plants. This gives them a very severe check, and often proves too much of a good thing. A medium course, which answers well, is to begin at one end of the row of plants, dig out one or more spadefuls of earth, and heel the plant half over, by placing the spade within 6 or 9 inches of it, and levering it over. Then take out a spadeful of earth between this plant and the next ; place it on the neck of the first plant, then heel the second over. And so on with each plant in the row, and all the rows in the piece, until all are laid. A good many of the roots thus escape destruction or disturbance, and the check is less severe. This is decidedly the safest mode of hardening brocoli by checking them. In any case the head of the plant is turned to the north. In mild localities such winter preparations may not be needed; but in large districts the laying of brocoli is a regular autumn operation. Those who do not heel over mostly earth up as highly as possible. This strengthens the stems to resist wind, as well as keeps out frost. Such high earthing should be given to *Brussels Sprouts*, *Kales*, *Savoys*, *Walcheren* and *Cape Brocoli*, for immediate use, *Coleworts* and *Cabbages*, as well as the *Winter* and *Spring Brocoli*. The earth not only strengthens the stems, but keeps them warm.

Cabbages.—Some more of the strongest plants may be placed out on potato or other root ground.

Cauliflower and *Walcheren Brocoli.*—Look over advancing crops daily, and cut them. These are deliciously sweet at this season of the year, and being crisp and tender, are easily frost-bitten. Hence the importance of daily watching. As soon as the heads are fit to eat, cut and store and place in a cool cellar. I often plant the last Walcheren brocoli on carrot or parsnip ground this month. If the winter be severe, the plants perish; but if not, we often have abundance of such sweet heads right up to the new year. And a pinch of seed and the labour of planting don't cost much.

Cauliflower plants may still be planted under protectors, or hand lights; *Lettuces* the same, and in more sunny places. See that the slugs and snails do not dine off them on warm days, or sup off them on mild nights. Attend to the blanching of *Endive*, earthing up and storing of *Celery* for a week's use at a time, and the covering of the crowns of the ridge with litter, if sharp frosts should come.

Hoe and thin winter *Spinach* and late *Turnips*. Destroy weeds which grow very fast during the month. Sweep, clean, and roll walks, wheel manure, dig, trench, and drain, if need be, vacant ground, and let care for the present, and provision for the future, be your motto in the kitchen garden throughout October.

THE FRUIT GARDEN.

Clear it! Short and peremptory order, is it not? But not more so than is needed. No fruit is safe outside after this month. Frost means ruin to all fruit: if it does not convert it into pulpy masses of softness, it robs it of all flavour.

It is well, however, to gather the ripest fruit first, as a week often makes all the difference, and it is about as mischievous to gather fruit too early as to eave it too late. As a rule, frost withers and shrivels fruit into rotten worthlessness. Not always, however. There are one or more plums, notably the Imperatrice, hat is best when shrivelled, and in this state it will keep for weeks on a dry shelf, and be all the richer or being kept. But these form exceptions, and are not applicable to the great keeping fruit crops—apples and pears. But how are we to know when he fruit is ripe enough to gather? Well, it is rather difficult, but it comes easy with practice. The educated eye can tell by the colour: there is a peculiar mellow look about ripe fruit, which cannot be defined, but which can be seen and at once recognized. To villa gardeners there is the old test of cutting a fruit asunder, and testing the brownness and plumpness of the seeds as named at page 261. Many fruits, especially ate varieties, must be gathered whether they are ripe or not. The frost is at their heels, and they must be plucked and placed beyond its reach. Until that danger arrives, however, gather only the fruit that is ipe. After a few seasons, special knowledge of the different varieties, and their seasons of ripening, will make all this simple and plain. The worst mode of testing for maturity is a small pinch between finger and humb, which is utter ruin to all the fruit so tried. The right mode of gathering fruit has been already adverted to. It is almost as important as the proper time. The light touch which holds fruit firmly, without bruising it, can only be acquired by practice. We remember how the light-fingered gentry taught the Artful Dodger their peculiar touch. Similar care is needed to handle fruit expertly, without leaving the shadow of a finger-print upon it. It is a good plan to place very choice varieties in earthenware pans, jars, or flower-pots. Fruits keep better in the darkness than the light. The less and more carefully fruits are handled, the bettter they will keep, as every bruise is but rottenness in embryo; and rottenness is but the faintest bruise run to seed.

Other plums, such as Coe's Golden-drop and Coe's late red may be induced to shrivel like the Imperatrice. They will keep well on a dry shelf, or hung up by the stalks in a storeroom or kitchen, and become more delicious the longer they are kept.

Late Peaches, like the Admirable and the Salway, must be gathered and placed in a fruit-room to ripen. They will often keep for weeks, and ripen well after they are gathered.

Pears are frequently brought into season, when wanted by similar means, and even the more radical one of placing them in close jars, and burying the jars with the pears for ten or more hours in hot dung, of the temperature of 70 deg. to 90 deg. A higher temperature is dangerous, and even this is an expedient not to be recommended to villa gardeners, unless fruit is wanted for a christening, a wedding, a birthday, or some equally great occasion.

Morello Cherries, *Currants*, or *Gooseberries*, that are closely matted or canvassed up, should now be undone; insects and dead leaves, and every dead fruit removed, and if fresh, they may be re-done up with substances thick enough to resist slight frosts. Such fruits are valuable for desserts, tarts, &c., all through November.

Having gathered all the fruits, the leaves of small trees may be assisted to fall by a whisk upwards with a twig of birch broom. If the leaves fall by being lifted to the horizontal line, their functions are completed, and the wood will be better without them. But on no account must greater violence be used to defoliate fruit trees, as, while the connexion remains firm and strong, the work of the leaves is incomplete.

The sooner preparations can be made for replanting and transplanting fruit trees or bushes, the better. Not that we should recommend it to be done till next month. Root pruning should, however, be completed during the month. The advantage of severing roots early is, that they begin to grow again directly, and form fresh roots before growth is arrested by the frosts of winter. For the mode of root-pruning and the seasons, see another paper in this number. Experience has demonstrated that root pruning is really a panacea.

Strawberry Plantations may be top dressed, and manure wheeled on to gooseberry, currant, and raspberry plantations, in dry weather. Sweep up leaves as they fall, destroy weeds, top dress, roll, c walks, and let the charm of the most scrupulous cleanliness and perfect health be everywhere found throughout.

THE FLOWER GARDEN.

It must needs begin to fade. But a long winter is before us; let us therefore keep our autumn beauty, as long as we can experience it, as perfect as possible. With care, the flower garden may continue a garden of flowers all through the month, and perhaps longer. It is well thus to pluck, as it were, the garland of beauty from the hard hand of winter. By constantly picking off dead flowers as fast as they fade, and leaves as soon as they become sere, it is wonderful how much freshness and summer-likeness remains. If the fogs will but keep off, the flowers will stand the cold, and even the rains, bravely. But the fogs fall so softly—pierce so deeply, and burden the flowers so heavily, that they must needs perish. The burden is too heavy and too cold for the delicate flower's back, and they look, after a fog, as if part of them had dissolved, not into thin air, but cold water. But, barring the fogs, the flowers will pull bravely through with our help. And if the fogs do all—well, it is all over with the flower garden—that's all. And that we have done what we could to keep its beauty with us as long as possible, will reconcile us to its loss when it does come, as come it must soon. But many seem to help the flowers away. As the sun loses its brightness, the air its genial warmth, the plants are left to struggle on beneath a load of seedy flowers and withering leaves, to die a lingering death by inches—a wretched end to a glorious summer-tide of beauty. Up to the last day, let beauty look cared for, valued, loved. And then, when the frost appears, the beauty fades at once. The memory of it will thus be pleasing and sweet. With every preparation made, there is little danger to the plants in thus waiting for the end. The first bite of the frost is seldom fatal. There will be time to save what needs saving after it comes. Then, like others who are also ready for a greater change,—

> "The flowers daily await, without terror or grief,
> The summons that tells of the fall of the leaf."

There is no danger, and need be no undue haste. The sharp peremptory summons of the frost cannot be ignored. It forces itself on our attention. But we need not run to meet it, and anticipate, by weeks or months, the day or night of its appearing. This is just what many do. Because winter is coming, beauty is allowed to come and go, or droop unseen or uncared for. We turn our backs upon it because it cannot last, and thus rob ourselves of its last fond look. I hope no villa gardener will be guilty of this folly. Let us treasure the last rose of summer, and nurture it as tenderly, prize it as highly, as the first flower of spring. The earth will be hard, bleak, and bare—long enough between them.

But while thus risking something of the future for the beauty of the present, the portable flower garden, that is, the store pots, pans, or boxes, for next year, must be made safe under glass. Cuttings of *Calceolarias*, and even *Verbenas*, may yet be put in. The former do best under a Protector, hand-light, or cold frame. They will strike any time during the winter when unfrozen, and be all the stronger and more useful next May for their hard treatment. Dibble the little side shoots about 1 inch long into sandy soil, about 2 inches apart; water well, and place glass over them. All they need throughout the winter is air in mild weather; water when dry; and exclusion of frost.

The greater proportion of *Pelargoniums* are generally potted in small pots in the autumn, and kept underground for next summer decoration. These old plants flower freer than cuttings. The plants should be shortened back to about 6 inches long, the root pruned in to 2 inches or 3 inches, and potted in light rich soil. If the pot can be plunged in bottom heat, for a fortnight, young roots will be found, and the tops begin to grow. The plants can then be gradually hardened off, and treated the same as rooted cuttings throughout the winter. Pelargoniums winter best near the glass in a temperature of from 40 deg. to 45 deg. or 50 deg. They will live in a lower temperature, down to 35 deg., but many will die under it, and more will rot from damp. It pays, when practicable, to give all the variegated pelargoniums comfortable winter quarters, say 45 deg., with plenty of light and air in favourable weather. Before the garden passes away, seeds of choice varieties of Phlox Drummondii, Asters, Stocks, Zinnias, Marigolds, &c., should be saved. Unless very choice, however, save no seed. Buying from the best foreign stocks, we are almost sure to have better strains than saving our own. The climate is better, and special culture is given to the seed, which results in higher quality and larger flowers. There is no easier way of ruining your gardens than filling them with plants raised from very ordinary seed of your own saving.

Dahlias, Marvel of Peru and Gladioluses should be taken up, slightly dried, and stored beyond the reach of frost. They keep best when wintered with the earth upon them, provided they are not put away damp. It prevents the tubers or bulbs from shrivelling, and preserves them plump and firm.

While taking up some bulbs, we must hasten to plant others. As soon as the dead or decaying plants and leaves are cleared off the flower borders or beds, Hyacinths, Narcissuses, Crocuses, Irises, Snowdrops, some of the earliest Anemones, turban Ranunculuses, and Alstroemerias, may be planted. It is important, in planting bulbs, to plant them all one uniform depth; otherwise, they will flower very irregularly, one bulb after the other. To ensure this uniformity of depth with rapidity and despatch, it is a good plan to have a dibbler pierced with several holes, at from 1 to 4 or 6 inches from the bottom. A cross pin of about 2 or more inches long is run through either of these d the dibbler is pushed down to this each 'he holes are thus formed all of the same ll the cross pin is shifted. The proper depth determined by the size of the bulbs, and by :umstances as whether they are to be cropped h other plants taken up annually, &c. From inches is the utmost range allowed for such ; here specified. In ordinary cases, 4 inches 1 depth for crocuses, snowdrops, and tulips; for hyacinths, and 9 for narcissuses.

the distances apart, it is very much an affair ıtity, of bulb, and objects aimed at in plant- ulbs are mostly planted in rows, patches, or In rows, crocus and snowdrop bulbs may touch each other. Having ample space on de, they need less room between each; and ɔus unbroken lines of glowing colour are ective. Some, again, plant three or four lines ıgether, of one or of different sorts, such as lilac, orange. This gives great breadth of In the patch style, never less than three ɔe placed within an inch or two of each other, one patch, while nine together should be imum. In forming beds, there is no limit as ɔers. Crocuses and tulips may then range from s to 9 apart, hyacinths from 6 to 12, and nar- as much or more. Smaller bulbs, such as luses, may be as close or closer than crocuses; mones of all varieties and colour form magni- nes or beds 6 inches asunder. Liliums and ulbs may be deeper, though these need seldom from 15 to 18 inches. Gladioluses, again, to 12. Most bulbs do best near the surface. l root from their base; so that the roots have to feed under the bulbs. Hence, if the bulb ly placed deep enough to escape the frost and ught, it will find the best filled larder, as a ıt far from the top of the ground.

'y *Annuals* may now be sown, such as Nemo- Limnanthes, Saponaria, Clarkia, Virginian Calliopsis, Escholtzia, to stand through the and flower early in the spring. When spring s expected to be full and plentiful, special means : used either this or next month to produce it.

, Forget-me-nots, Alyssums, Arabises, Aubric- ansies, Polyanthuses, Auriculas, Primroses, huses, &c., must now be planted in the places d by summer-flowering and herbaceous plants, ıout the summer. These, with the bulbs and ɾill make a grand show from February to June, ıcceeded by those now being cleared off. The y of late seasons is to make the flower garden of beauty, perfect as a wheel, with no spoke . To succeed in doing so, winter clearing and ɼ must proceed together.

ı both are completed, war must be waged the fast falling leaves. The broom, the roller, nild weather the mowing machine, should be lively exercise. Possibly, the gravel may have ɔrightness by the wear of the season. If so, now is a good time to top-dress it, so that, if the skies are leaden, and the prospect somewhat dreary, fresh gravel may spread its cheerful face over all. As a ringing peal of childish laughter at a pic-nic is to the solemn mummeries of "Do-the-boys' Hall," so is sparkling light gravel to November fogs. It forms the silver lining to the leaden clouds—walks, I mean. Nothing lightens up a garden, large or small, like fresh gravel in winter. This great charm, with clean, smooth, green turf, will make the garden enjoyable, without a flower at all.

PITS AND FRAMES.

These are apt to become too full at this time of the year, and also to be kept too close. Every tender plant should now receive the protection of glass. But there is no occasion for this glass to be kept on always. On every mild day, the plants should be fully exposed. The hardier they can be kept, the more safely they will be wintered.

Pelargoniums that have been fresh taken up out of the flower beds and potted, should have a little bottom heat, if possible, to start them. But even during this root stimulation, the top should be preserved cool. *Verbena Ageratum*, *Petunia*, and other plants or cuttings, must also be kept cool and dry.

Auriculas, Polyanthuses, Pansies, Pinks, Carnations, Picotees, Mignonette, Violets, Lily of the Valley, Hyacinths, and other annuals intended for blooming in pots, should all receive the shelter of glass, to prevent them being soddened by wet, or frozen through.

Choice *Hollyhock* cuttings may yet be put in, and slowly rooted during the winter. *Calceolarias* and *Cinerarias* should be placed near the glass and carefully guarded from frosts. Cinerarias, especially, are very easily injured. Pots or frames containing these must be covered with mats every night. *Strawberry* plants in pots, *Roses*, and, indeed, everything intended to flower or fruit out of season, succeed best if preserved unfrozen and unsodden from this time.

All plants for immediate flowering in the glass house, such as the latest Zonal Pelargoniums, early Chinese Primroses, Chrysanthemums, Fuchsias, &c., should now be removed from pits and frames to make way for such other things as those named. During severe weather, the sides of these structures and Protectors must be covered up with straw litter. This, with a double mat or thatch of straw over the glass, will render them frost proof.

THE GREENHOUSE.

All such plants as Azaleas and Camellias should have been housed early in the month. And no Heath Cytisus, Coronilla, Epacris, Callas, nor other greenhouse plant, must remain out a moment later than the end of it. Pelargoniums of all kinds house early. Those intended for early flowering, give their final shift forthwith. Small shifts are safest at this season, and, indeed, best at all seasons for Pelargoniums. The greatest danger is over-potting, resulting in death winter, and large leaves and but few flowers in summer.

Fuchsias should be gradually dried off; but the dryness should not be carried to excess, else the roots will be injured. The plants now, after the leaves have fallen, should have some water once a fortnight or three weeks.

Chrysanthemums will need liberal supplies of water, clean and foul. An ounce of guano stirred into a gallon of water is one of the best drinks for such plants. Tie up the plants neatly, and thin the buds to from two to three on a shoot, if large flowers are wanted. Give abundance of air to prevent mildew on the leaves, and instantly sprinkle with dry sulphur to cure it, if it once appears.

Chinese Primroses, water with care. Apply the water on the surface of the soil, and not in the heart of the plant or in the axils of the leaves. Such waterings often destroy the plants.

Camellias swelling into flower, *Coronillas*, and such plants, expanding their blossoms, will need more water than Heaths or Azaleas in a semi-dormant condition. Callas, again, will need abundant supplies of water; and the other hardy ferns must be watered sparingly in winter. Most of them will be at rest, and no plant at rest needs much food or drink. Just in proportion as the quantity of water needed decreases, the care in its application must increase. Any one can water flowers in summer, but in winter it needs all the skill of the most skilful to water aright.

All *Climbers* must be cut, or tied in as closely as possible; for, as the sun declines, every ray of light becomes doubly valuable, and no internal shadows must be permitted to shut out the little light there is. Cleanliness, so important at all seasons, is doubly so in winter. Flower shelves, stages, walls, roofs, pots, surface soil, the plants themselves, should all be without spot, or moss, or dust, or any such thing. Such thick-leaved plants as Camellias, are wonderfully improved in health and appearance, by having the leaves sponged clean. This makes them shine like the faces of well-scrubbed school children; and the flowers never look so charmingly as when set off by glossy shiny leaves.

Admit air freely on mild days, in fact every day, unless the thermometer is under 40 deg. outside. See to the means of heating the glass house, and test its efficiency, and have all things in readiness, so that a fire could be kindled at once. As you value your rest at night, your peace of mind, and the safety of your plants, see that whatever else you do, or leave undone, this one thing you must do, viz., see to your flues, furnaces, and means of heating, else disappointment, and possibly death to the plants, may be the issue.

The Dairy and Poultry-Yard.

CO-OPERATIVE DAIRIES IN AUSTRIA.

To encourage the establishment of joint-stock dairy companies, the Austrian Government have offered the following prizes :—Two prizes of £60 (with each of which a gold medal is given), to be competed for by associated dairies, which work up daily into whole milk cheese not less than 124 gallons of milk. Should two or more com panies make the same quantity, the decision of the judges will be based in a great measure on the quality of the produce, and the organization and satisfactory working of the rival establishments.

Three prizes of £30 (with each of which a silver medal is given), to co-operative dairies, making daily up to, but not over, 124 gallons of two-meal or half-coward cheese. In awardng the prizes, both quantity and quality of the produce to be taken into account. Not only such dairy companies as are already established, but any others which may come into existence, and commenced operations before July 1871, will be entitled to compete. Only those are excluded—unless meanwhile completely re-organized—to which a prize was awarded in 1868. Written application must be made to the Government authorities before 1st October 1871, and to every application must be added a detailed and strictly veracious answer to the following queries :—

1. How long has the association existed, and by whom was it founded?
2. What is the present number of members?
3. To what parishes do the farms of the different members belong?
4. What is the number of cows kept?
5. Have the members pasture land in common?
6. What is the form of agreement on which the association is based? (A copy of the same with the rules and regulations to be enclosed?
7. Is the factory the property of the association or merely rented, and what are the arrangements and conveniences of the building?
8. What salary does the head dairyman receive, and what are the wages of the helps?
9. What is the quantity of milk daily worked up?
10. What are the chief, and what the minor products of the dairy? Is a thermometer used to regulate the heat of the milk intended for cheese-making? What is done with the waste substances—whey, butter-milk, drainings from the cheese, &c.?
11. How is the dairy produce disposed of, and what are the average prices it fetches?
12. What was the total amount of produce sold in 1871, and what sum did it realize? What did the working expenses amount to, and what was the sum—representing net profits—divided amongst the members of the Association?

Amongst other steps taken to improve the dairy husbandry of the country, and to increase the production of better quality, cheese may be mentioned—the distribution of improved utensils, the holding of periodical exhibitions, the publication of pamphlets advocating an extension of the co-operative system, and the organization of further educational facilities for those intending to devote themselves to the rearing of cattle and the manufacture of dairy produce.

As the founding of dairy schools, each with its efficient staff of practical and theoretical teachers, is necessarily attended with very considerable expense, instead of increasing the number of these institutions, it is proposed to utilize, for purposes of instruction, private and joint-stock establishments already in existence. With this end in view, dairy farmers of standing and repute, and directors of successful cheese factories, will be solicited to allow a certain number of young men—the sons of peasant proprietors and others—to enjoy the privilege of familiarizing themselves, by personal observation and study, with the most approved systems of dairy management.

In addition to a practical insight into

details of manipulation and routine work, it is hoped that in many cases the students will have the advantage of oral tuition on the following subjects:—the rearing, feeding, and tending of cow stock, the preparation of cattle food, the different operations connected with the making of butter and cheese, and the chemical processes involved in their manufacture; the preservation, sale, and consignment of milk and milk products; and the economical employment of waste or refuse materials, such as sugar of milk, butter milk, whey, &c.

The course may be expected to last six months, say from the beginning of March until the end of August. It will involve a mininimum expenditure of £7, 10s. per man, and in order to enable poor and deserving students to visit dairying establishments, such as those of Voralberg, Wurtemberg, and Bavaria, the Agricultural Society of Vienna has just founded three scholarships of £15 each.

ADVICE TO DAIRYMEN.

THE following paragraph, in Mr Willard's address before the Canadian Dairymen's Convention, cannot be too strongly impressed on the minds of all who are engaged in providing milk for cheese factories or private dairies:—

Your manufacturers cannot cleanse filthy milk, and out of it make high-priced butter or cheese. The great demand now is for sweet, nutty, new-milk flavoured goods. It depends on the farmers whether your dairies and factories shall become noted as the best in the land, and their goods be sought after and contended for by shippers and consumers. There must be cleanliness in milk—no dogging or racing of herds to the stable, overheating the milk, inducing ferment and decomposition—no kicking and banging of cows, no commingling of diseased milk with [illegible] cows that are s[illegible] [illegible] their milk [illegible] this, that we may be able to bring the character of American dairy products where they shall have no rival in the markets of the world. There is nothing pays better than kindness to milk stock. No man has a right to abuse his stock, and keep it in a constant tremour of fear and nervous excitement, and then poison consumers with the milk and beef of such animals. The best milk comes from upland pastures. In the division of your lands let the low or wetter portions be devoted to meadows. Stock require a variety of herbage, and you should seed with a variety of seeds. Remember that many varieties of grass growing together will produce more food and make a more enduring turf. Provide corn fodder at the rate of an acre for every eight cows, so that when pasture begins to fail in July and August, you will always have an abundant store of succulent food at your command to keep up the [illegible] In this way you will turn [illegible]t, and get from your [illegible] results.

DAIRY FARMING.

THIS was the subject of a paper read at the last monthly meeting of the Whitby Chamber of Agriculture, by Mr Kerr. The first consideration in establishing a dairy must be the class of land and the quantity and quality of the animals it is calculated to carry. It is advisable to have them rather under than over the capabilities of the soil. The land and the stock should be kept in about the same ratio in improving condition.

EXCELLENCE OF AYRSHIRE BREED.

If the dairy was to be the principal source of profit on the farm, the breed of the stock ought to be selected for its milk-giving capacity. But if milk, butter, and cheese be only considerations in conjunction with the breeding and rearing of cattle as a source of profit, then a more valuable breed would be desirable. He thought the Ayrshire breed could not be excelled in quantity of milk and good condition. The breed was characterized by hardiness of constitution, and gave a large quantity of milk in proportion to the quantity of food they consumed. He believed they could not try a better cross than one between a pure shorthorn bull and a pure Ayrshire cow.

In any case where the object was twofold, the stock should be sufficiently well bred to be fattened and cleared off in two years, so that the permanent stock of milkers might be as little interfered with as possible. A well-bred bullock would bring as much at two years old as another would a year later, if its parents were coarser bred. If the animals had to be kept as stores, they were always remunerative in proportion to their quality.

By adopting the plan of rearing only the heifer calves, keeping them till after the second calving, and disposing of them towards their third calving time, the produce of the dairy might be lessened to some extent; but there were never any old cows to be weeded out, which must be sold for less value; it lessens the profits of the season. Besides, the milk of the old cows was not so pure in quality; and, taking into account the amount of food they required, there was an inducement to part as quickly as possible.

CROSSES SHOULD NOT BE USED FOR BREEDING.

No cross-bred animals, no matter on what pretence, should be used for breeding purposes. At the present time it was an easy matter to procure shorthorned bulls, of good quality, at prices within the reach of men of moderate means. The extra price would soon be covered by the improvement in the young stock, and by the time they were two years old the bull might be considered out of debt.

It must be admitted that the success accompanying the breeding of good cattle, under proper management, would be much greater than the breeding of inferior stock.

REARING OF CALVES.

The success of the farmer in rearing calves is very important. Every calf lost was of great consequence. The greatest care, therefore, should be taken during the time of gestation, and all cases of premature birth should be avoided as much as possible. Parturition in the cow might be attended with difficulty, and required judicious action, and ought to be well understood. Main force was exercised, and the result of such treatment was often the death of the cow from inflammation. The cow ought to be left to herself, and kept as quiet as possible, except under extraordinary circumstances, and then only such force used as was consistent with the case. The calf should be fed frequently with its mother's milk, in small quantities; and in order to give it a fair start in life, it ought to feed on new milk for three weeks, or longer if delicate. It was a well-known fact that quarter ill, a disease so prevalent and fatal amongst young cattle, was less frequent where liberally fed on cake.

APPLICATION OF THE PROPER AMOUNT OF FOOD.

No greater mistake could be made than to allow young animals to go back in condition. During the first month it would be found a safe plan to give three doses of castor-oil, which might prevent many of the ailments to which the young animals were subject. Each calf ought, if possible, to have a separate compartment, and be left at liberty. If they could not find a separate compartment for each, they should put three or four in a loose box or comfortable shed, where they could be easily fed, and with a rack or manger for their use. The better they fed a cow, the b
her produce would be, and the greater t pr

Yet how many owners of dairy stock acted as if it were of little importance whether the food was up to the mark, either in quantity in quality? Without good food, a cow, however good her milking qualities might be, would not continue long in full profit. During the summer months the pasture was their principal dependence, and on good land nothing else was required, but much harm was done by allowing cows to remain in the fields far into the autumn while in a milking condition. During cold and wet nights they could only seek out the best shelter the hedges would allow, and there lie down; whereas a small quantity of food in the house would be as good as what they could get out of doors, and they would be kept warm and comfortable. If they lost flesh in the winter, it was not easily made up again.

THE QUALITY OF FOOD.

The quality of the food and the regularity of giving were most important and essential matters. There was a striking difference between the milk and cream of cows fed on hay and straw, and the milk and cream of those fed on cake or meal in addition, the former being comparatively thin and poor, while the latter was thick and rich. Not only was the produce of the dairy increased by cake, but the manure made was of very superior quality. This was a fact of great importance. It could not be expected that pastures would continue to yield the same quality of milk, butter, and cheese, unless some return was made to keep up their fertility. Many of the large dairy farms of Cheshire had been allowed to get into such an exhausted condition, that the farmers had to resort to crushed bones, and apply them at the rate of 7 cwt. and 8 cwt. to the acre.

The construction and careful management of the dairy demanded serious attention. If this was neglected, it was in vain that good cows and good food were provided. There were many dairies in which no expense had been spared to render them perfect, but these were principally on the home farms of gentlemen. With the ordinary farmer the case was very different. The dairy ought to have a north or north-west aspect, and away from the vicinity of manure, refuse, or other sources of offensive smell, which were always inimical to dairy produce. The floor should be laid with cement or tiles to prevent damp. With regard to the utensils, he had not much to remark, and he doubted whether the leaden cooler could be surpassed, except by glass. There were a great many new inventions in the way of churns, many of which cost a lot of money, and were, at the same time, comparatively useless. The barrel churns, in simplicity, were scarcely to be surpassed. In making butter, the great desiderata were cleanliness, good ventilation, and the presence of pure air. The improvement in the art of cheese-making, especially in the large dairy districts, had been very great; but it was still in an imperfect state. It was well known could not be denied that the making of cheese that many individuals in this district had attained a high standard of perfection in this art, but many were still far behind. He believed that cheese-making was no exception to the rule which applied to other branches of agricultural industry—that science might yet do much to improve it, and materially add to the practical results.

THE INFLUENCE OF THE MALE BIRD.

THE *Poultry Bulletin* discusses this question; and its conductors have undertaken a series of experiments to determine how far the influence of one impregnation extends among fowls.

It is important for us to ascertain whether the same views apply to oviparous animals, and if at all, how far. It is stated, upon apparently good authority in poultry works, that one connexion is sufficient to render fertile all the eggs which a turkey hen will lay at one season. This is doubted by some, but seems to be well authenticated. The opinions on this question, when applied to fowls, vary wonderfully. Some maintain that each egg requires the separate service of the cock, while others point to experiences which would justify the application of the doctrine that non-fecundated eggs in the ovary are impressed by the cock, so that when subsequently fecundated, the progeny are affected, even after the laying of one clutch. If there is the slightest foundation for this latter view, the necessity of keeping fowls separated at all seasons of the year becomes imperative; while, if the other view can be established, breeding fowls can be permitted to intermingle during the fall and early winter months. Without venturing an opinion on this subject, we would ask if it is not possible to institute experiments which shall absolutely determine it? We propose to place a laying black Spanish hen with a rose-combed white Dorking cock; then to remove her, and pen her by herself, apart from any cock, and to place her eggs, laid while thus apart, either in the incubator, or under hens, until we shall have established the fact that she is laying eggs which are not fertile. After we are well satisfied that she has ceased to lay fertile eggs, we shall again put her with a black Spanish cock, and marking each egg that she shall then lay, we shall hatch them. By this means we can establish how many of the eggs are impregnated, and whether the influence of the cock extends beyond those actually fecundated. A series of experiments, simultaneously conducted by other breeders with other varieties, strongly opposed to each other in their markings, would determine the natural law which governs this question.

A correspondent of the same periodical gives his experience as follows:—"A hen escaped from a market waggon in the woods, went to a solitary hut, laid a clutch of eggs, and brought out twelve chicks. There were no fowls kept anywhere near, hence, nearly, or quite, the entire clutch must have been vitalized before her escape."

The writer was breeding light Brahmas and Danvers whites. These last are a breed which, according to the "American Agricultural Annual" for 1867, originated in a cross of buff Cochins and white Dorkings, and for twelve to fourteen years have been bred white, with bare yellow legs, by accident, one dark Brahma cock got with the Danvers hens, and the result was that the chicks came, shewing the cross distinctly, others very little of the Brahma, and others none at all, except a tendency to feather upon the legs, which in some cases never amounted to even a single perfect feather.

A neighbour had a bantam rooster running with his hens; next to him a friend was breeding games. It was quite early in the season, and noticing after a while that the bantam came over occasionally, he thought perhaps he might tread a hen, and so he had a tight coop made, and kept his hens in, and for fear of the bantam, did not save an egg for over a month. It may have been nearly two months—I think it was—before he had chickens hatched. What was his surprise, when they were hatched, to see several of them with feathers on their legs like the bantam cock!

The Apiarian.

COVERS FOR HIVES.

IN summer as well as winter hives require protection. If not shaded from the summer sun, the combs are likely to become softened at their fastenings, and drop down in a confused mass. The rays of the sun should be warded off by coverings of some kind. And it is well when not a drop of rain can touch hives, either in summer or winter. Of course, rains in summer that touch hives do less harm than in winter, inasmuch as the wetted parts are sooner dried in hot weather. It may be stated as an axiom, that perfect protection of hives, from both sun and rain, should be aimed at in covering them.

Milk pans are in common use in many parts. With small hives they answer in summer, but they are a miserable protection in winter. For cheapness and convenience, anything *at hand* that will shed the rain off hives in summer is made use of. Three or four cabbage-blades placed on a hive, and held there by a stone, are often used till something better turn up. We now use felt (sold at 1d. per foot) largely as a covering for hives. It is impervious to water, and very durable; indeed, I cannot yet say how many years it will last. The covers of felt that I got four years ago are as good as ever they were, and apparently will last for an indefinite length of time. These felt covers suit as well, for they are very light, soft, and pliable, and can be carried about in small compass. When we remove our bees to gardens in the country, the felt covers go with them; and when we remove them to the moors, we find it more convenient to take them for covers than it is to cut peat-sods on the spot where the hives may be set down. Another inducement to us to use these felt covers is that they are not very conspicuous; and this is a consideration to us, if not to other people, for we are glad to get permission to set a few hives down in any *odd* corner, even at a distance from any human abode.

These felt covers are rather thin for a burning sun; hence it is wise to place a little hay, or heather, or grass, or rags between them and the hives.

Sods cut off peaty land and dried are impervious to wet, and make excellent summer coverings. But straw coverings are incomparably the best of all—best for summer as well as winter; and they look better than anything else I have seen used as covers for hives. When a farmer's corn-stacks are all well thatched and nicely clipped, they not only please the eye, but convey to the mind of every passer-by the idea of comfort, and also that his profits will not go into the wrong pocket. A row of well-thatched beehives in a cottar's garden is calculated to please the eye, and breed pleasant thoughts to the mind.

These are simply made, by tying one end of a bunch of straight or well-combed straw with tarred string, dipping them in water before placing them on the hives, hooping them on, and then clipping them neatly. When put on wet, they set, and stiffen to fit, and may be lifted off and on like a man's hat. When well made they last two years. As hives out of doors cannot be kept too warm in winter, the reader will, in another place, be urged to protect his bees from the cold of the winter storms, by giving them not only a good outer covering, but plenty of *under flannels*.

Thousands of hives are starved to death for want of food, and thousands more for want of sufficient winter covering.—*Pettigrew's Handy Book of Bees.*

MY METHOD OF SWARMING BEES.

THIS is the title of an article which appears from C. C. H., in the *Maine Farmer.*

In a multitude of counsellors is wisdom, i.e., if one has the wisdom in himself to accept as authority the wisest counsel. In the rather delicate operation of artificial swarming and previous queen rearing, I have used the following method with the greatest success:—

First, for queen rearing I select from a stock selected for its superior activity and working qualities, two or three frames, one or two of a brood in the proper stage, and one of honey, with enough bees to maintain the necessary degree of heat, which I place in an empty hive and cover with a flannel, which retains the heat. In this nucleus I find usually six to ten perfect queen cells, if I have enough bees and plenty of brood in the right stage. About the eighth day I take from as many stocks, less one, as I have cells, bees, honey, and brood, and form other nuclei, one for each cell, which I insert carefully in each, being sure to put the cell in the centre of the brood, that it may be discovered and protected. Let these second nuclei stand twenty-four hours before the cells are inserted, else the bees, unconscious of their loss, may destroy them. This I had to learn by experience.

To make my new swarms, I divide my bees and combs as near as possible, one-third of the bees in one hive and two-thirds in another, which last I place upon a new stand, but the combs equally. By using the queen and bees that were taken from the same hive and divided, it is not necessary to cage the queen or use other methods which may disturb the day's work, and by using a fertilized queen nothing is lost by waiting to rear one. I never divide without either a queen, or, in default of one, a capped cell, which saves much valuable time.

METAMORPHOSES OF BEES.

ACCORDING to recent careful observations made in Switzerland, the development of queens (says the *American Bee Journal*), drones, and workers, proceeds as follows, in the ordinary temperature of the hive in spring and summer:—

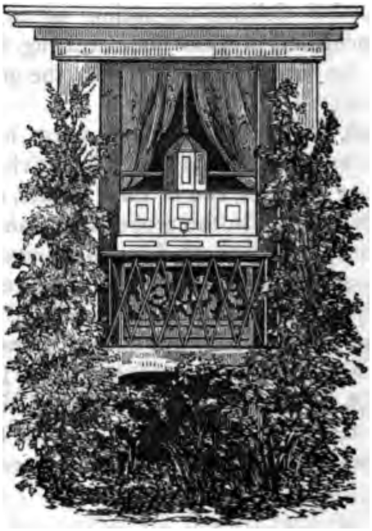
The egg hatches on the third day after being laid. The queen remains in the larval state, in the open cell, five days; the worker five days, and the drone six days and twelve hours. In spinning the cocoon, the queen spends one day, the worker one day and twelve hours, and the drone three days. After spinning the cocoon, the queen remains a larva two days and sixteen hours, the worker three days, and the drone two days and twelve hours. After changing, the queen remains in the nymph or pupæ state four days and eight hours, the worker seven days and twelve hours, and the drone nine days. Hence, from the capping of the cell to the issuing of the bee, the queen usually requires eight days, the worker twelve, and the drone fourteen days and twelve hours—making, from the laying of the eggs to the emerging of the perfect insect, the normal period of sixteen days for the queen, twenty for the worker, and twenty-four for the drone. This period, however, is occasionally hastened or retarded by the peculiarly propitious or unpropitious state of the weather or the temperature of the hive; and the term has been found to vary,

In the queen,	from the	15th	to the	22d	day.
„ worker,	„	19th	„	26th	„
„ drone,	„	23d	„	28th	„

HOW TO SEE BEES AT WORK.

[From THE VILLA GARDENER.]

THERE are several excellent periodicals which devote a portion of their pages to the art and mystery of bee-keeping, and with this particular speciality it is not the province of THE VILLA GARDENER to interfere. A correspondent, however, who dates from Oxford, desires information on a matter which is strictly within our province, viz., how best to arrange the hives, so that the working of the industrious insects may be leisurely observed by an invalid without leaving the house. In reply, we are glad to be able to give our correspondent a hint which may be useful. The late Mr Loudon was considered in his day a good "bee-master," and at his villa at Bayswater he had a Nutt's hive placed in the front of one of his library windows. This window was protected by a verandah, and the front of the hive was placed on a line with its pillars, and was, consequently, protected from perpendicular rain; but as the excessive heat of summer is equally injurious with rain, he had the hive protected from that and from the sudden influence of either heat or cold, by a casing of broom and heather intertwined. For examining the bees at work, the back of the hive next the wi dow had a sliding door of wood, covering square of plate glass, so that when the do was lifted the bees could be seen at wo Our engraving will give an idea of the mo of placing the hive.



Arrangement for a Bee-Hive at a Window.

Our Library Table.

his Own Cattle Doctor. By Francis Clater. *r* re-written to the present time. By Armatage, M.R.C.V.S. London: ck Warne & Co.

ook which cannot fail to prove of very to the agriculturist. Indeed, it should be of every country gentleman. It treats on all ses in cattle, sheep, &c., in a manner so in the description of the symptoms and to apply, as really to entitle it to the tor has given it, "Every Man his Own or." It is unusually free, as a book of the echnicalities, and where it was impossible ard words," a copious glossary at the end ir meaning very fully. It is also enriched able of contents, and a capital index—two the greatest importance, which are very ed, or "scamped," in many volumes combine science with practice in the rt. The book is well printed, bound in , and profusely garnished with excellent hich actually and effectively illustrate the of obscuring it, as woodcuts in many cases will not allow us this month to give more extract, of a general character, in addition le at page 265, to shew the style of the is an enthusiastic and skilful labourer in n; but we shall return to the book again. we commend it to our readers:—

EATMENT OF BREEDING EWES.

essity for close attention to breeding ing the time of gestation cannot be too ed upon, but errors in this direction may, o, arise in the excesses which are uncon- ulged in. The supply of good food is d as ewes advance in pregnancy they are ake sufficient exercise; the result is that nd dangerous plethora ensues. Great s is on this account needed. Improving hould be gently regulated by diet of a ture, carefully alternated with the daily f corn, &c. When green food cannot be ots are imperatively called for in small d quantities. When ewes are confined to r small folds, these particulars need close Common salt as a condiment is here oisonous. Artificial preparations, known ods and condiments, are also worse than he whole question becomes one of a highly ture, and, known as *hygiene*, would profit- the stockowner to a far greater extent nount of study in the treatment of disease. n is better than cure," and when the laws nd principles of feeding and diet are more closely comprehended, thousands of animals will be saved that now suffer from disease, and their death hastened by physic, under a mistaken idea of curing it.

Sutton's Bulbous Flower Roots, Plants, Seeds, &c.

We have received a copy of Sutton's "Autumnal Catalogue for 1870," setting out a large and varied assortment of newly imported plants, roots, seeds, and flowers, together with directions as to their culture and careful keeping. The following cuttings from the catalogue with regard to the cultivation of hyacinths in beds will shew the style of information given:—

"The bulbs should be planted from the middle of September to the end of November, in light rich soil, about 9 inches apart, with the crown 3 inches below the surface. It is very desirable to plant in dry weather, for unless the ground is in good working order, the bulbs are almost certain to become unsound. About the middle of December, the surface of the beds should be covered with an inch or two of partially decayed leaves, which serve as a protection against frost, keep the beds from becoming saturated with rain, and afford nourishment to the roots. When the blooming season is past, give the bulbs plenty of water to promote growth, and assist the formation of flower-buds for the following year. After the leaves have withered, carefully take up the bulbs, and lay them in a sunny place for a few days, when they should be cleaned and stored away."

The Veterinarian's Pocket Remembrancer. By George Armitage, M.R.C.V.S. London: John Churchil & Sons.

We have to acknowledge the receipt of this book, which is handy for the pocket, and which will doubtless be useful to those who are called upon to prescribe in emergencies.

Stables and Stable Fittings. London: St. Pancras Iron Work Company.

The stalls and stable fittings generally of this Company have been recognized as being superior in their construction and in their mode of contrivance, fitted to insure the safety of the animal in the stalls, together with its comfort. The strength and durabitity of those fittings reflect an amount of credit and praise upon the Company. This book, which is published by the Company, is well written. It describes and recommends forcibly the workmanship of their stable fittings; but the Company do not wish their opinions to be taken on trust. They solicit a visit of all interested in the care and well-being of the horse to their stable of ten stalls and their loose boxes recently erected ir Pancras Road.

Co-operative Agriculture: A Solution of the Land Question. By W. Pare, F.S.S. London: Longman & Co.

MANY will have a vivid recollection of the unfortunate condition of the agricultural classes in Ireland forty years ago. Then crime pervaded the greater part of the land in a hideous form, and with a threatening aspect. Murder was an event of daily occurence, and the fury of the mob was especially directed towards those obnoxious landlords and their hirelings, of whom Ireland at, the date of the opening of the book (1830-31), had unfortunately too many. The exertions of the police authorities to put an effectual restraint upon the atrocities and outrages which had already disgraced the country, were perfectly futile. The peasantry demanded reductions of rents and increase of wages, demands which were met with obstinate refusals. In the opening chapter of this work, Mr Pare draws attention to the dark history of Ireland at the date referred to. "The distrust (he says) existing between landlord and tenant in those days, may be imagined when I state that I have seen lines of carts laden with potatoes and pork brought by the tenantry into Cork market, attended by the agents of the several estates on which the produce was raised, to whom was instantly handed over the proceeds of the sales, in payment of rent." Mr Pare goes on to relate that in the height of this reign of terror the experiment of co-operative agriculture was commenced. A gentleman named Mr John Scott Vandeleur, of some position and fortune in the county of Clare, determined to risk his capital in the "New System;" and the system is thus explained by Mr Pare:—"The object was nothing short of converting the drunken, dissolute, and criminal labourers on his estate into one large, well-ordered, and gradually-improving family or community, living together upon the land, and working upon the capital of the proprietor, which in the course of years was to be redeemed by their labour, and then held in common for the equal benefit of all; their wants to be supplied from a common store, from which were to be excluded all intoxicating drinks and tobacco—things thought by the Irish to be so especially necessary for their constitutions; the whole to be governed by laws of their own approval, securing equal rights and equal means of enjoyment for all, and in the administration of which they were to share, through the medium of a certain number of the directors of the association, to be appointed by and from among themselves." Houses built of stone were erected for the members of the association. The entrance and expulsion of any member into or from the society was determined by ballot; and thus Mr Vandeleur, assisted by an able secretary, Mr Craig, maintained the perfect amity and concord of the "Ralahine Co-operative Agricultural Association." Above all, the distasteful and obnoxious stewardship was abolished. The work of the day was determined by the committee (nine in number), and the directions of the committee were accepted by the men as final. The children, too, of the labourers were well educated, and cared for during the day when their parents were at work.

The wages of the labourer were 8d. per day, the common currency in Ireland, with the provision that, as the society increased in funds, after paying the landlord £900 as rent and interest for implements, so would the wages of the labourer. The proceeds of any extra exertions, therefore, on the part of the workers, after paying, under any circumstances, the £900 as rent to the landlord, were proportionately divided amongst the men and women engaged as servants on the estate.

Unfortunately, after a short but successful career, the Ralahine Co-operative Agricultural Society came to an abrupt end, owing, as Mr Pare explains, to the flight of Mr Vandeleur to America, consequent upon gambling habits.

The book is readable and interesting, so far as the account of the experiment itself goes, but the extraneous matter has a slightly "gushing" tendency.

Hints to Stockowners; or, Some Short Remarks on Some of the More Important Departments of Stock Management. By W. Robertson, V.S., &c. Kelso: J. & J. H. Rutherfurd.

IF Mr Robertson's remarks upon stock management are "short," his sentences, like his title, are long, and length scarcely adds to their explicitness. In his preface the author remarks, "It does certainly seem anomalous that those who are not sparing of expense in the treatment of their animals when actually suffering from disease, should fail to understand the value of advice which is given with a view to its prevention." There is no more anomaly about this than there is in a man perfectly healthy failing to perceive the worth of a doctor's recommendation to take drugs. Why should farmers pay for the prevention of disease which does not exist, or for the conservation of health which is conserved, unless, indeed, veterinary surgeons are to be paid for the same, as family doctors? To some extent, we believe, this would be advantageous, but it is a difficult matter to make farmers believe, when their own stock, and that of all their neighbours throughout the district, are as healthy as could be desired, that they ought to pay for the prevention of disease. Indeed, there is no disguising the fact that farmers rather look askance upon veterinary surgeons, and do not care to see them coming about their folds when there is nothing amiss; and sometimes this feeling is not quite so irrational as on first sight it seems. During the time of the rinderpest, it was a common, and, we believe, not an ill-founded, belief, that disease was spread by the inspectors. We quite agree with Mr Robertson, however, that stockowners should seize and act upon every practicable hint thrown out by veterinarians.

The Country Gentlewoman.

MIDDLE-CLASS MARRIAGES.

E following very suggestive and ensible letter, under the signature of iddle-class Governor," appears in a number of the *Pall Mall Gazette*. bject is one well deserving the atten- our readers :—

en the representatives of the two ouses whose chiefs possess whole s, are united, or Lucy Mill, daughter millionaire of Cottonopolis, is given in k to my Lord Tomnoddy, there can eason why the duke or the mill-owner not bestow a magnificent trousseau on ghter, and give a sumptuous wedding st to a hundred friends and acquaint- Nay, if all the tenantry of the one, workmen of the other, were to be on the occasion, it would not trans- Philosopher Square's doctrine of the s of things." But that middle-class , struggling against increased prices creased taxation, should give way to xtravagance, is one of the weaknesses of e, against which you may advantage- protest. As in the case of expensive ls, so in the case of costly marriages, is wasted at the very time when it is wanted. The condition of many a couple during the first year or two of d life, would be raised from one of dis- rt, if not of privation, to a state of rative affluence, if they had in hand oney spent on the "trousseau" and the ng breakfast. The magnificence of irst start makes them feel all the more ecessity of the subsequent thrift. The on thus engendered, that marriage is an of fine clothes and white horses, and agne and mayonnaise, is soon dissi- by the stern realities of the loin of n, the cheap sherry, and the four-wheel cab; and then comes a long sigh and a wish that they had the money. The young wife turns over the fine clothes which she has no chance of wearing, and vainly endeavours to solace herself, while her husband is at office, with a "midshipman's holiday"—"overhauling her kit." In the course of a few months, she sees, with feeling approaching to despair, her "trousseau" going out of fashion; and perhaps she in heart reproaches her mother, although she had begged hard for all the finery herself. Why, sir, I have seen girls under the ceremony of marriage to some poor curate or junior clerk, in bridal dresses fit for the wife-elect of an earl; and I have known wedding breakfasts given at the Star and Garter, Richmond, or some kindred house of entertainment, the cost of which would have sufficed to pay the butcher's bill of the young couple for more than a year.

And then the wedding presents! What a melancholy exhibition of inappropriateness and folly! I have seen a sickly smile on the face of a young clerical bridegroom, as he has sighed confidentially into my ear while standing by a table covered with bijouterie of all kinds (many duplicates, of course), "These fine things will wonder where they have got to, when they find themselves in my poor home;" and I have heard the irreverent jest of a brother-clerk in a public office on a similar occasion, "If these things are not up the spout before the year is out, they will be exceedingly lucky!" In the name of all that is sensible, let rich people make such presents to rich people; but in humbler life let the presents be of a serviceable kind. What is the good of having table ornaments before you have a table to put them upon? If the relatives and friends of a young couple in the middle classes would supply them with useful household articles, instead of trumpery gauds, as unsuitable as the fine dresses of the bride, they will do what is equally rational and kind; and although a young girl may pout a little on first opening a parcel containing three or four dozen of towels, or a dozen tablecloths, she will acknowledge the considerate kindness of Uncle John before she has seen six months of wedded life, and value the towels or tablecloths more than the china flower vases, already cracked, sent to her by Uncle Ferdinand Albert. I believe that in some countries these sensible things are done, and that even sacks of flour are not considered unbecoming wedding gifts. But here in England, we go in for all kinds of pretentious absurdities. We spend our money on useless things which young people do not know what to do with, and leave them to get their tables and chairs, and beds and linen, as best they can, out of their slender purses.

Now, there is no earthly reason for all these several absurdities, except that "it is the custom." But what a custom! I believe that there are hundreds, nay, thousands of men of the middle classes, like myself, who would willingly emancipate themselves from this miserable thraldom. It is natural that young girls should like fine dresses. It is not natural that they should be provident, far-seeing. I am inclined to think that the fault rests with us veterans. We consent to these follies; and then complain that we have been run into debt, with small chance of ever getting out of it. Let us commence the necessary reform ourselves. We need not do the "stern parent" over it. I suspect, much as has been said about "the girls of the period," that there are not many whom a kindly parental explanation of the folly of spending on the pretentiousness of a single day, money that would be serviceable to a young couple for a year or two, would not thoroughly convince. The excessive folly of the thing is patent on the surface; and it needs but that some influential journalist like yourself should call attention to the subject, to cause us, middle-class fathers, to shake off these bonds of custom, and to cease from making fools of ourselves.

THE

UNTRY GENTLEMAN'S MAGAZINE

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LEASES AND GAME.

T the meeting of the Cheshire Agricultural Society, Sir Philip Egerton made following remarks on the above subject. will be observed that Sir Philip, although, understand, a capital landlord, is a special ader for his own order. He can believe the badness of a tenant, but he seems to ubt that wrong can be perpetrated by the mers of the soil. Restrictions in leases are cessary to secure the landlord's interest. o clauses are required to preserve the nant's rights. Proprietors, like princes, it uld appear, in the eyes of Sir Philip Eger- n, can do no wrong, which is hardly the ar-bought experience of many farmers. e instance that Sir Philip gives of his nerosity about allowing the tenant to sell s hay, although he meant it to tell in the posite direction, is one of the strongest oofs he could have adduced as to the ischievousness of many of the restrictive auses in leases. The fine round phrases out a feeling of honour between Christian an and Christian man sound well, but, en, how can it well exist when so many ases assume that Christianity is all on the de of the landlords? On game, Sir Philip seemingly pretty sound against over-preservation, but we doubt that a panacea would be und for the evil in the encouragement of -hunting. Here is Sir Philip's speech :—

As to agreements between landlords and tenants, had read many pamphlets and many speeches on s subject, and, so far as his judgment went, all that he had read had been based upon a false foundation —that of the possibility of adopting one regular and uniform plan in the drawing up of all agreements between landlords and tenants in the United Kingdom. He thought it would be impossible, owing to the different habits of the people, the difference in the modes of agriculture, and the varying customs of different neighbourhoods, to establish one form which would adapt itself to the whole country. Of course, if the foundation were rotten, the superstructure must fall; but he would say a word or two about that. It proceeded on the assumption that all ought to be left to the tenant. He perfectly agreed with that, if all tenants were good tenants. Any landlord could truts a good tenant, but he must have some hold upon a bad tenant. Now, all the restrictions in leases were for the purpose of protecting the landlord against the bad tenant, and not with the view of tying the hands of a good tenant. They knew perfectly well that if a bad tenant got hold of a farm, and took everything off it without putting anything into it, the farm must deteriorate, and if it went into the market and a tenant could not be found, the landlord was obliged to take to the farm and work it for eight or ten years before he could get a tenant; and therefore it was necessary there should be some restrictions, but that they should be interpreted liberally. He would give them an illustration of what he meant. In his leases there was a condition, that for every ton of hay taken off the farm, a fine of £10 should be imposed. The other day, he met a magnificent team of one of his tenants taking a load of hay off, which had been sold, and his only regret was, that it had not been sold when hay fetched as much as now; and he (Sir Philip) was glad of this, because he knew that man had manured his land with sovereigns. Although he had it in his power to have fined that tenant £10 for every ton, of course he was glad to see him making a profit of his farm in that way. But if that hay had belonged to a tenant, to a man who had neglected his farm, then he had the power in the lease to come down upon him. He gave this to shew that a liberal feeling ought to exist between the landlord and tenant. Depend upon it, no written document, or anything a lawyer could devise, was equal to a good understanding between landlord and tenant—a mutual feeling of dependence one upon the other—a feeling of honour as between man and man, and Christian man and Christian man. The form of letting depended not upon landlords nor upon tenants, but upon both, and societies such as that were very well calculated to promote mutual good feeling between them. That led him to another subject which had been much discussed—the over-preservation of game; and certainly, in some districts, there was an excess of game—he was not alluding to rabbits, which were vermin, and ought to be exterminated—he had no feeling for a rabbit, except it were smothered in onions. But with reference to game, not in excess, he thought it would be for the benefit of the farmers to encourage it. They knew very well that gentlemen must have amusements, not battues, but moderate shooting, provided rabbits could be kept down. It was his greatest pleasure to see his neighbours coming out to beat, and take part in the sport. In some counties, where there is an excess of game, he thought there ought to be some special arrangements, not only as between tenant and farmer, but between the holders of adjoining farms, where the one farm is likely to be overrun with game from another. Still, the great thing was to keep gentlemen in the county; because, if the game were wholly destroyed, there would be nothing for gentlemen to do, and they would go to where they could get shooting. He did not think this county suffered from an excess of game; but, depend upon it, the secret of keeping down game—he would tell them all, and he wished it were known beyond that room—was to encourage fox-hunting—not that the foxes destroyed the game, but because the landlord invited all his friends to partake of the sport; and that, not to speak of collateral advantages arising through the sale of oats and other things, helped to keep down that excess of battue shooting more than anything else in the world.

And surely Sir Philip is not serious when he sets gentlemen's love of sport against the interests of the farmer. Because a gentleman must have amusement, does it follow that he must purchase that at the expense of the tillers of the soil? Sir Philip, we think, greatly maligns his order when he says, "The great thing is to keep gentlemen in the county; because, if the game were wholly destroyed, there would be nothing for gentlemen to do, and they would go where they could get shooting." What a wretched opinion Sir Philip has of the duties of a county gentleman! All that he has to live for is to shoot down a few feathered creatures, as plentiful and as tame as farmyard poultry, or hares and rabbits, which feed off the farmers' turnips like sheep! If Sir Philip Egerton would lay to heart the following lines, he would never again speak so lightly of the duties that rank and wealth impose:—

"If time hang heavy on your hands—
Are there no beggars at your gate,
Nor any poor about your lands—
Go teach the orphan boy to read,
Or teach the orphan girl to sew,

and the time so occupied need not even interfere with moderate sport, while the duty is imperative.

E DUKE OF NORTHUMBERLAND AND SOCIAL SCIENCE.

Duke of Northumberland, in his inau- ral address to the Social Science s, which this year held its annual meet- ewcastle, touched upon several points of terest to Country Gentlemen. From his which was one exhibiting much careful the great problems Social Science seeks with, we make the following extracts :—

LOCAL AND CENTRAL GOVERNMENT.

ose who recognize the inevitable consequence ange which has taken place with respect to ies of that power from which the governing is, in fact, though not in theory, an im- emanation, it will appear most desirable that rtments on which devolve the executive func- he State should partake as little as possible of meral character of the transient administrations y, or of the capricious and arbitrary nature of lation of the assembly from which these admini- are taken—that the Executive departments e permanent, easy of approach, and em- to pronounce, through their chiefs, final s on questions submitted to them. Yet, in on to their merits will be the rapidity of their on of the minor, though cognate powers, now d to local bodies, and I acknowledge that I h the utmost jealousy on all progress in this . No one is more aware than myself of all the iences and drawbacks attending the petty s by which local and municipal action is always encumbered. I have played a certain that stage, and have had personal experience nischief arising from them ; but still, with all in my recollection, I must own that I dread dency to a change which shall, by degrees, ny countrymen to avoid the trouble of adminis- heir own affairs, and to withdraw themselves e annoyance and labour of the parochial, al, and other duties connected with the locali- which their lot is cast, to deprive them of the ool in which they may fit themselves for duties ces of a higher class, and to inflict on the Government many which it can but most ately discharge, and, above all, whilst leaning r every petty detail of local administration, mpt them to blame it for every trivial short-

In proportion, also, to the direct pressure of ducated class, and to the lowered tone of those k popularity and power at their hands, the nce and disgust of the refined, the intellectual, indolent, acts more powerfully in deterring m a public career, and prompts them to invoke the aid of the central Government against local oppression. As duties become more complicated, as greater powers are required to keep in order the ever increasing pressure which the augmenting density of human existence creates, even men of sterner stuff begin to fear the responsibility, the unpopularity, and even the danger attaching to the discharge of public functions. Again, the impatience under local burdens urges men to insist on throwing as much of them as possible on the general taxation of the country, and they are but too willing to purchase the benefits of reduced local contributions at the cost of the independent control of their own funds—a control which must, when the expenditure is thrown on the general resources, be of necessity exercised for the benefit of the whole body of contributors by the central Government, to the exclusion of local authority. The central Government, in its turn, continually exposed to the interpellations of the idle member of Parliament, whose only object is that his constituents may see his name in the public paper, is ever more and more disposed to check freedom of action in its subordinates; and yet the popular will, expressed through Parliament, is ever pressing it to undertake responsibilities which, if left to itself, it would and ought to avoid; and it must not be forgotten that, as the central Government becomes more powerful and more despotic, whether it assumes a Parliamentary, popular, aristocratic, or monarchical form, it becomes ever more and more intolerant of all opposition to its views, and ever more inclined to yield to the temptation to undertake the functions of so-called paternal Government. And yet, lamenting these tendencies, and believing that they cannot fail, in some degree, to deteriorate the character of the nation, it may be doubted whether there are not functions now entrusted to local bodies which, in certain conditions of our varied polity, urgently require for their proper execution a more stringent supervision on the part of the central power. Where large bodies of men are crowded together, and herded as in our manufacturing towns; where the greatest destitution is brought into direct and galling contrast with enormous wealth; where every incentive to evil, whether bodily or mental, is present, and excitement is both produced and increased by contact; where there is every inducement to attempt to redress by violence the evils under which so many suffer, in such a condition of existence, I say it is obvious that the most powerful and instantaneous checks must be brought to bear on the passions; and for this purpose, something of the liberty of action enjoyed in a less feverish and exciting atmosphere may, for the general protection, be surrendered. On the other ha it seems most necessary that the direction of the force required to repress and keep down the evil propensities so engendered, should be vested in hands which cannot be charged with, or suspected of, acting under local influences. On this account it may seem desirable, in some instances, to widen the area of action, and give greater freedom from the pressure of local ideas and interests, in respect of the administration of justice, and the organization and command of the force whose office it is to repress offences against the law, and enforce its decrees. So, also, it may be thought that some higher authority, in addition to that of those bodies in which the law has vested the sanitary control of their several districts, should be charged with the duty of compelling action, where the local *vis inertiæ* sets at naught, as is too often the case, the provisions of permissive legislation—a species of legislation, to my thinking, anything but desirable, indicating at once a want of conviction and courage on the part of the lawgiver, and inviting neglect of the obvious intentions of the Legislature in deference to local prejudice.

SEWAGE OF TOWNS.

There is no question which weighs more heavily on the mind of him who contemplates the condition of the masses of humanity aggregated in cities like that in which we are now met, than that of the sanitary regulation required for their very existence, and without the due observance of which earth, air, and water become so many *foci* of disease and death. Royal Commissions have been issued, by whom a very exhaustive examination into the causes of mischief and the means of their removal have been made. I trust that the Society will be favoured with communications of the highest value on the points. *Sic tuo uti, ut alieno non noceas*, is a maxim binding on communities as well as on individuals. Neither the one nor the other may transfer the responsibility of the removal of evils, of which they are themselves the cause, to the shoulders of others. The law justly refuses to sanction the infliction of an evil on our neighbour, however necessary it may be, and at whatever cost, to remove it from ourselves. It is satisfactory that in towns situated like Newcastle, if the embarrassment found in disposing of the matter complained of is great, it has been sufficiently proved that, commercially and financially speaking, it can in most cases be done at a trifling cost, if the proceeds of the money so invested be set against the outlay of removal. No expense has been spared in bringing the necessary supplies of pure water to most of our cities and great towns. The difficulty of dealing with it after it has been rendered noxious by the uses to which it is there applied, and its consequent pollution with refuse matter of every description, is principally that of carriage. Some recommend its purification by filtering, which, supposing this effectually done, still leaves the trouble and expense to be incurred of conveying away the solid residue. Others, and I think it the more correct solution of the problem, recommend that the water should continue to convey its burden to sites where it can be allowed to deposit it as a fertilizing agent in the soil; and, whatever the cost in particular localities, this appears, on the whole, the most natural and the least operose of the schemes devised, and, by the proof of experience, effectual for the object desired. The state of the law, with respect to the poisonous products which some manufactories discharge into the sewers, and which thus find their way into waters hitherto uncontaminated, will scarcely be thought sufficiently stringent by those who are exposed to suffer from the unwarrantable proceeding. I trust that the reading of some papers on the subject, which we may hope to hear from those of our members who have examined into this matter on behalf of the Government, will demonstrate to all concerned that the prevention of the mischief is alike practicable and generally inexpensive; but, at all events, it should be considered by the manufacturer as part of the cost of the processes, and as a first charge on the profits of his manufacture. The physical evils affecting the condition of the huge masses crowded into the comparatively narrow area of our large towns, are, however, hardly less palpable than the moral mischief consequent on this unnatural and unwholesome condition. But the latter, alas! admit of no mere physical remedy. Palliatives must, of course, be applied in the shape of improved lodging, greater facilities for cleanliness and ventilation, better supplies of water, and, as far as possible, the enforcement of the provisions against the pollution of the air by smoke; but these are but palliatives which can only be carried into effect by a far more close and diligent system of supervision than is, or perhaps can be, at present exercised.

SURPLUS POPULATION AND EMIGRATION.

It is a saddening thought that, raise the existing population to whatever pitch of comfort and prosperity you may, that very prosperity only invites the influx of the needier portion of that of the surrounding districts, and when the reverses to which all commercial and manufacturing societies are exposed take place, the new comers do not, as a rule, return to their original localities, but remain an ever-increasing burden of want, wretchedness, and moral debasement on the communities into which they have migrated. What remedy is there? I see none, unless it be the bridging over the distance, so to speak, between the labouring population of this country and those regions where the demand for labour is greater than the supply, by a regular and systematic plan of emigration, which shall, as far as possible, surround the emigrant on his arrival in another land with the same influences, institutions, and advantages as he leaves in the mother country. I am happy to see that amongst the subjects to be submitted to your attention that is likely to be fully canvassed, and that there are those amongst us who will bring r on it the experience of many years of service in a great variety of our colonies. to, Government emigration may be said to have onfined almost entirely to the labouring class, the protection of that class its attention has olely directed. No one thinks that it ought to een less. But it may be a question whether it not go further, and that by some admixture of nts of a higher class, great benefit might not be ed on both. It is generally held that, without apital, a man above the rank of a labourer or workman is useless as a colonist. Is it impossible to devise some course of special instruction and training by which such persons may be fitted to seek abroad a freer existence than that afforded by the only occupations which are open to them at home, overstocked as the market for their employment, and consequently ill paid as their service, is? But if this idea be held to partake a little of the visionary, no one will dispute the advantages emigration offers to every one, whatever may be his antecedents, who seeks a market for the the manual labour he cannot dispose of at home.

MEAT AND DRINK IN RUSSIA.

SHORT time ago we gave an extract in our columns from Mr Andrew Murray's rate report on Russian food and drink, eference to a fish called the sterlet, which, urray thinks, might be introduced with itage into this country. We now give a iary of the general food and drink of the ians, from the same report, which has been shed by the Science and Art Department:—

breads, he says, resolve themselves into modi- ns of three chief kinds:—tschernoi-chleb, black made of rye; kalatsch, white bread made of ; and saika, white bread enriched with raisins her accessaries, equivalent to our buns or the h "cookies." Ices are made in great perfection Petersburg. A very good kind is flavoured by azel-nut; and still better is a water-ice made the juice of the clucva or cranberry (gathered he berry has been touched by frost), sweetened lightly flavoured with vanilla. This is much or invalids, and in our own country, its refresh- olness and slightly sub-acid flavour would be inexpressibly grateful to the fevered palate. In mmer, a great traffic in beverages is carried on principal streets, and the most common is a rose- ed drink, which owes its colour and its virtues clucva. St Petersburg is well supplied with vegetables. The vegetable staple of the country cabbage. At the beginning of the winter, every lays in a store. The plants are then chopped o thin slices, and packed in barrels with vinegar lt; a certain amount of fermentation ensues, and bbage becomes a kind of sour crout. From these s a portion is taken as required, and made with nto a cabbage broth called "shtshi." This is the haracteristic national dish in Russia, and is the ood of the mass of the people. Meat is only about half the price paid in England, and consequently is much more freely used. In the shtshi there is always served a number of lumps of the boiled meat of which the bouillon is made. At a restaurant, for forty kopecks (about 1s.), Mr Murray had a plate of shtshi, with three large pieces of meat in it, sufficient to make a copious dinner for any average Englishman, so that although St Petersburg may, to some, be one of the most expensive cities in Europe, to others, it may be one of the cheapest. To enable the consumer to give to shtshi the degree of acidity which may suit his taste, a small dish of sour cream is placed at his side. Sometimes also (for the Russians are great in accessories) a small plateful of fried or roasted groats—a substitute for bread—is eaten with a spoon alternately with the shtshi. Another accessory of dinner, of which the Russians are fond, is music. Every restaurant of any pretensions has a barrel-organ to play during meals—a large, handsome instrument, generally occupying the whole of one end of the room, and from which is heard the rolling of the drum, the thundering of the kettledrum, the clashing of the cymbal. Every popular new air is at once added to its repertory. A food product, which figures largely in the consumption of the upper classes, is mushrooms and fungi, which are found in great abundance in Russia. The preparations of milk and curd appear more various than in this country. Sour cream is a favourite accessory to many dishes. It is used with pork as we use apple sauce; pork seems to be regarded in all countries as requiring some accompaniment of more or less piquancy. The mutton in Russia, as in all the plains of the north of Europe, is much inferior to our own. The red-legged partridge is common and cheap in Russia, but not equal to our own partridge. The pigeon is never eaten; it is a sainted animal to the Russians. The fishes of Russia supply some of the most peculiar and best national food products.

After referring to the sterlet and the sturgeon, as already given in our columns, Mr Murray goes on to say—

Another favourite fish at St Petersburg is the schnepel, which is cured and smoked, and tastes something between a fresh salmon trout and a kippered herring. It is an exceedingly palatable and rich fish. The monks are said long ago to have introduced an allied species, the vendace, into Lochmaben, where it survives, without trouble, to the present day. It does not require to go to sea, and any proprietor could introduce it at a trifling expense if there is, upon his estate, a mountain rivulet coursing to a mountain lake. There are other fishes peculiar to the Caspian, deserving attention, as the berchenka and the vobla, a cyprinoid fish; but they would not bear the change to our seas. With regard to the drinks of Russia, it is said that the water at St Petersburg causes diarrhœa to new-comers using it freely, until they become acclimatized. The coffee, "when made with care, under the superintendence of the ladies of a household," is not to be surpassed. The tea used is a light, delicate-flavoured tea, from the north of China, never, at the strongest, getting beyond a light amber colour. The Russian's hours are late, and his last meal is usually a cup of tea. Of the fermented drinks made in Russia, there is, first, a poor beer called "quass," manufactured from the remains of the rye used in making bread. It is much like what is known here as "treacle beer." Hydromel, an undecided beverage of a mild character, is a fermented mixture of honey and water, not unlike rather flat ungingered ginger-beer. The wines of the Crimea, Bessarabia, and the Caucasus are gradually improving, and acquiring a character of their own. The "vodka" includes all sorts of liqueurs. The practice of the Russians is to take a vodka before dinner, and with it, by way of whet, a mouthful or two of caviare and bread, or sardines, or "shimaiah," which, if not a salt herring, is a very good imitation of one. The guests saunter up to the sideboard or side-table to take this. Strangers unacquainted with the custom may sometimes be misled by it. A large party of the horticultural guests at St Petersburg were invited to one of the Imperial Palaces, and received by one of the Emperor's great officers in a room where all the materials for a vodka were set out. The visitors mistook it for a standing luncheon; and the servants interchanged comical glances when relays of caviare, bread, wine, and liqueurs were again and again required. A triple serried phalanx surrounded the table, and the shy and the late-comers could not penetrate it. When the most courageous had thoroughly appeased their hunger, and were breaking into open order, they were amazed to find that the banquet awaited them in another room. As will be observed, Mr Murray's report is confined to what may be called normal food; but he was shewn specimens of articles eaten only on occasions of great scarcity—lichens, saw-dust cakes from the north, and different kinds of clay from Central Russia. These, we hope, we may not need; but he has described some articles which would be welcome on our tables.

FLAX CULTURE.

THE idea of extensive flax culture in England has rarely entered into the serious consideration of agriculturists; and yet its practicability and profitableness surely deserve more attention than has hitherto been given to them. In the past, the produce of flax crops has met with a sale as ready and certain as that of food crops. At present, that branch of trade requiring flax as raw material is but in comparative embryo; and so far as it may be allowable to forecast the future, it seems as if a greater supply of fibre was all that is necessary to lead to such an increase in flaxen goods, as would enable consumers to have more of linen and less of cotton goods at their disposal.

But it is neither in its relation to the probability of increased demand for flax fibre, nor to recommend a speculative crop, we approach the subject; but simply to invite attention to the fact that, as matters are at this moment, a greater proportion of flax culture in England would result in a larger sum total of agricultural profit in this country. A fair turn in a well-ordered rotation (always laying down the flax field in grass), would give for flax crops in England, after allowing liberally for all unsuitable soils, and forbidding it to be attempted where other crops pay better—an area capable of yielding a supply which would be exchangeable as readily as corn or cattle crops, to the amount of £8,000,000 to £10,000,000 annually. This extent of flax crops would neither interfere with hops nor peas—as flax can never be profitably introduced into soils exactly suited to either—but with grain crops only, and that to no greater an acreage than about or under one-fifteenth of what is usually under these crops. Such a disturbance would not seriously interfere with existing customs, and on the farm as it would tend, collaterally, to several changes on the whole beneficial, it might safely be recommended, even if no assurance of a differential profit could be offered in recommending flax culture.

The best soil for flax crops is dry, deep loam. The best condition is, to be well pulverized, and free from stones; but flax has been successfully cultivated in soils of every variety, and good crops have been raised when but little attention was paid to the preparation of the land. Amongst the many popular errors about flax—the idea that it is a difficult crop, is one which has not the colour of reason for its support. If a farmer aims at profits, every crop requires attention, and each demands treatment peculiar to itself; but beyond these conditions, common to grain, potato, and root crops, flax is by no means a troublesome or precarious crop. Another notion, as popular as it is erroneous, is, that flax is an exhausting crop. The fact is, while soils containing the constituents indicated below, supply food to the flax fibre, with the least exhaustion to their general fecundity; yet the soil suffers but little in producing flax. There is no special mystery about the secrets of germination in flax seed to make the farmer fear his soil would be robbed of all its fertility by such a process, even though it contained not, in a marked degree, the best flax-feeding elements, viz.:—Silica and silicious sand, from 69 to 72 per cent.; oxide of iron, 5 to 6 per cent.; alumina, 7 to 9 per cent.; phosphate of iron, 1-10th to ¼ per cent.; carbonate of lime, 1 to 1½ per cent.; magnesia alkalies and traces of muriatic and sulphuric acids, &c., ½ to ⅓ per cent.; organic matters, 5 to 9 per cent.—the balance, to make the 100 parts, being water.

The point, however, to which we address ourselves at present is not the simple question, "Will flax pay," but will it pay better than the crops it would necessarily displace? Autumn ploughing, careful harrowing in spring, an amount of labour in sowing very little in excess of what is necessary for grain crops, about 74 quarts Riga, or 64 Dutch, or 74 home-grown or American seed, costing on an average £1, 10s. to £1, 15s. (rarely £2), with cost of weeding, pulling, retting, and bleaching, not very much more than must be spent in grain crops, brings a flax crop into condition for the scutch mill, or makes it ready to sell to scutch millowners, whose business it is to finish the manipulation process. In case the farmer sells his crop green, which would be practicable, if retting on a large scale were carried on (a most profitable business), outlay would cease with cost of pulling, and if a good crop, £20 might be got for it green; or if middling, £12 to £15; whilst the produce of the worst of crops, short of a total failure, would be more likely to cover cost than that of a grain crop of like character. If the full process be carried on by the farmer, as is usually the case in Ireland, then the product would be, assorted seed for cropping, inferior seed for cattle feeding or oil-cake, scutched fibre, tow, choves, and other refuse convertible into manure, especially if absorbed into the water (a sort of liquor full of fatty matter), in which the flax had been steeped. By this mode of treatment, if conducted in a way similar to that adopted in grain crops in England, the net profit on the average of ten crops, after allowing for one crop being an utter failure, may fairly be set down at £10 to £15 per acre. Such a thing as 10 cwt. of flax per acre is not uncommon in Ireland, which, at £4 per cwt., is £40 for fibre alone. Some old-fashioned farmers still consider, most unwarrantably however, that the sacrifice of seed to fibre is necessary to such results, which is not the least more defensible than is the destruction of tow and choves, lest, if flax-growing were made appear too profitable, everybody would be at it. But assuming the fibre to be of only one-half the weight above named, and selling at the price mentioned, viz., 5 cwt. at £4, which is £20, with 10 bushels picked seed at 8s. and 15s., feeding-stuff at 4s., increases the product to £27, *plus* £3 for tow, and £2 for choves, and refuse (for manure), making £32, allowing £12 for rent of land, seed, labour, and all other expenses, and £5 for contingencies, there is a clear profit of £15 on an acre of an average, or below average quality.

We do not think it in the least degree necessary to reduce the above estimate, for reasons peculiar to a flax crop. The fact is, the investment of a few pounds for special implements requisite for this crop, is more than compensated for, by the reflexive influence on the consumption upon the farm of edibles (the nearer home the market for pork, butter, cheese, grain, &c., the larger the profit), consequent on the opening of new channels of labour as a result of extensive flax culture. We shall leave, for the present, the case as it is, for the consideration and the calm and unprejudiced comparison of our readers, of the estimate we now submit as to net profits on flax culture, with such estimate as they may make as to grain culture, only bespeaking attention to the following points, viz.:—1st, The highest estimate as to quantity of yield is not adopted: on the contrary, only one-half such weight is taken as the basis of calculation. Let, then, the like be done in regard to exceptional cases of extraordinary yield in grain crops. 2d, A high rent for the land is allowed, and a liberal sum totalled up for the several processes of manipulation, as well as the various kinds of work the growing of flax entails. 3d, The price put upon fibre is such as the finest flax sells at on the average of ten years. The quantity being reduced very low, a price is assumed which implies that it is on the very best quality the rate is fixed, and although inferior flax is quoted at lower rates, it is not necessary to assume a smaller figure; as doing so would be but special pleading against the cause at issue. There is one argument against flax culture in England, which seems to be more generally adopted, and more frequently used as an excuse for not thinking of it seriously, and that is, that although Government grants a subsidy to Ireland and the Royal Dublin Society, in connexion with the Royal Agricultural Society, and both ably supported by landlords of the south and west, and linen-lords of the

, in pressing the subject on farmers, yet ulture is not at all popular outside r, though the climate of Connaught and ter be the best for its cultivation in the d Kingdom. Our answer to this is, owever difficult it may be to account Irish farmers get so puzzled with the ness of everybody, Government in- d, to make them flax-growers, that they ach the business with reluctance, and engage in it on the strictly profit-and rinciple. Besides, the idea that there nething in the soil of Ulster, in the habits of its people, or the waters of its rivers and ponds specially adapted to flax culture and manipulation, has got so rooted into the popular mind south of Dublin and west of the Shannon, that the people of those parts never feel up to the sticking place in courage requisite for doing justice to flax crops. Still more, the inexplicably unreasoning notion is prevalent in Ireland that flax culture may be carried out profitably on a small scale. Sufficient must be grown to demand the erection of scutch mills; and to disregard this desideratum is to act very foolishly in flax farming.

HOME-GROWN FOOD.

CORRESPONDENT, writing himself down a "Fife Scot," in the *Edinburgh* *nt*, addresses the chairman and mem- of the Scottish Chamber of Agricul- on the above very momentous ques- He requests them to mark figures, he supplies, and to deduce there- rational results. Estimating the popu- of the United Kingdom at 30,000,000, marks, mankind cannot as yet live t food. In a general way, a healthy onsumes 700 lb. of solid dry food year. He assumes that each con- 200 lb. of butcher meat, at 9d. per lb., comes to £7, 10s. in the year, and 500 bread and other stuffs, which he ave- t 2d. per lb., or £4, 3s. 6d. per head, g the total of the cost of the food of 0,000,000, £349,500,000. We raise ves, unfortunately according to the Scot's" estimate, only £128,000,000 of r meat, and, in round numbers, only 00,000 of bread stuffs; and throwing imported agricultural commodities, ly add to our store to the extent 42,000,000, making, in all, about 000,000, or about the sum that should ended on two-thirds of our population. ems a sad state of matters, as a "Fife Scot" puts it; but it should be remembered that the census embraces others than healthy men. There are, unfortunately, sick belonging to the sex, and a very large proportion of women and children, who can hardly be expected to consume so much as a healthy man. But let this pass. The "Fife Scot" goes on—we summarize his words—

> Three million of paupers, criminals, and vagrants, cost the nation £25,000,000, which is just so much discounted from the industrial produce of the country.
>
> Government management of the country is wrong if it does not protect and promote the agricultural prosperity of the United Kingdom, and of all her dependencies capable of raising food; that the home landowners are wrong in protecting game, withholding land from cultivation, and continuing laws which obstruct or impose burdens on the practical agriculture of the nation; that the nation is wrong in not employing pauperism, criminals, and vagrants in works or land not sufficiently remunerative to induce the capitalist to undertake them, but which are beneficial in themselves, thereby compelling all idlers, to some extent, to make their own meat, in place of continuing the present system, which is all loss to the country; and the whole body of the people are wrong in storing up capital, or investing it in other pursuits than the promotion of agriculture, and the growth of food in Great Britain necessary to sustain the population in a healthy condition. The penalty of wrong is punishment. If the colonies, neglected by the Home Government, declare off from this country; if the landowner insanely keep on, for his own amusement, withholding

land from the plough and the fold; if pauperism, crime, and vagrancy are continued to be fed, housed, and clad in idleness by the nation, and do nothing towards self-support; then—as living man must have food to sustain life, as the country cannot grow food for the population, and the imports are far short of a necessary allowance—starving man will put forth his hand and take. In taking he will squander. A terrible dearth and reaction must ensue, and the greatest nation the sun has ever shone on must be destroyed—be literally eaten up by the Goths and Vandals reared by her own self, in her own midst.

There may be money in the country, but money is not food. It will, however, buy food. Yes, if in the hands of those who want food, and food is in the country to be bought. Money, however abundant in a country, if locked up in the hands of capitalists, will only buy food when the capitalist chooses to put it into circulation. Money in the hands of a starving people will create such a market that supplies will be freely imported, so long as the prices obtained pay the importer. When profits to the importer cease, imports cease. Abundant imports, then, depend upon abundant funds at the disposal of those that consume them. Abundant home growth of human food necessarily reduces the prices to all consumers. Everything is in favour of home growth, and without it a shutting of our ports at present would leave nearly one-third of the population foodless. But there is hope for the country. The millions must either have home-grown food at a reasonable price, or money at command to create a market for the importer at a profit. Without money at command of consumer—no market for profit, no importations.

Can we manage a healthful sustenance for all the population without it? The supply short of sustaining a healthful existence to all our people is, as before, £102,500,000.

If the 50,000,000 of arable acreage of the nation had an improved system of rotation in cropping, and the 22,000,000 of acres of pasture land permanently improved, then the deficit might be made up. But the crops and cattle are so dependent on each other [illegible] no permanent improvement can be effected on [illegible] without [illegible] bout manure [illegible] [illegible]

lords, such improvements cannot be effected. They must consent to encroachments upon the 22,000,000 of statute acres of permanent pasture lands, and on 4,000,000 of waste and uncultivated lands, so far as reclaimable. All Game-laws and others obstructing practical agriculture, or destroying the food grown, must be abolished. Improving leases must be granted, and facilities given to draw the requisite capital to the cultivation of the soil.

That done, a very few years would bring forth the desired surplus of............	£39,400,000
These improvements, accompanied by the abolition of deer forests—mutton taking the place of deer—would bring in annually still further..................	600,000
The abolition of the Game-laws would save the country a loss now entailed upon it—some say of £15,000,000—say..	10,000,000
The employment of paupers, criminals, and vagrants, in preparing for the plough and the fold the waste places which it would not pay the capitalist to undertake, would make them self-sustaining, to the extent of say half the present cost, now utterly and irretrievably lost to the country, say...........	10,000,000
Would bring up the surplus to......	£60,000,000

So that, after all, it appears the condition of our country, black as it is, has yet, even in the jaundiced eyes of a "Fife Scot," a silver lining. If we change our system of farming—break up our pasturage lands, where we rear the herds and flocks which make the beef and mutton our canny Scot so much desiderates—throw our deer forests into sheep walks for the animals that have been displaced by cropping—reclaim 4,000,000 acres [illegible] waste and uncultivated lands, "so far as [illegible]amable" (a happy proviso!)—abolish the [illegible]ame[illegible] improve leases, and employ [illegible] [illegible]minals, then in the course of a [illegible] have £60,000,000 towards [illegible] £102,500,000 for food [illegible] do you think? [illegible] that of the old [illegible] who spake more [illegible] to hear folk [illegible]

IMAGINARY CHANGES OF CLIMATE.

E consecutive years of drought, while
y have stimulated the inventive re-
practical agriculturists, have had the
fect of calling forth a plentiful crop of
n from weather prophets, and projec-
half-instructed meteorologists, and all
sophic tribe of Laputa in general, to
periodical press now affords such fatal
We have often noticed that in the
atements of those compilers of weather
ho write to the *Times*, useful and wel-
heir communications are, every season
to be "extraordinary," almost every
e of the driest or wettest, or windiest,
hottest, ever known. Much observa-
h ought to correct a tendency to exag-
ems in some minds to have rather a
to increase it. And many seem now
three hot dry years in succession as
g some general change of climate, as
ot perfectly certain, in the wide range
le of what we call chances, that with
g conditions of climate such a combina-
every now and then recur. We know
ous theorist who would fain persuade
cycle of six hundred unfavourable years
eached its termination, and that Eng-
ulturists, who left off making wine
1250, because their grapes ceased to
l soon be making it again, and con-
o so for an equivalent number of cen-
thers, speculating quite as conjectu-
even more absurdly, seem to attribute
ding change of climate—of which they
e reality—to the operation of men.
y that by extended drainage and the
own of trees the amount of rainfall
been diminished. As to drainage, it
ce to remember that our rain is de-
the evaporation of the Atlantic, and
ly to be affected by the diminution of
proceeds from a few swamps. As to
of cutting down trees, the subject has
le so much of in recent times that
to be treated more respectfully. Yet
two considerations which militate
e theory: the first relative to its ap-
o England, the second to the doctrine
. As to the first, it may be greatly questioned whether there has been, for some generations past, any diminution of our tree-covered surface. There is a balance of gain and loss. Some woods have been felled. Some districts, once rich in hedge-row timber, have been partially stripped for reasons of scientific agriculture. But, on the other hand, the Englishman's passion for planting and for preserving timber has been steadily at work in the contrary direction. Take the neighbourhood of London for an instance: any of us who are old enough may remember how, scarcely more than a generation ago, the spectator from any height commanding an extensive prospect would note great bare tracts of heath, of cultivated but unenclosed land, and of recently enclosed common with low treeless hedges. All this is altered now. Go where you will for a view in the "home counties," a sea of leaves seems to extend around on every side. And we believe that most people, if they consult their experience, will make the same report of the parts of the kingdom with which we are acquainted. The local authorities, who have been lately bestirring themselves to prevent the disforesting of the New Forest, on the ground of apprehended deficiency of rain, are certainly indulging in very imaginative apprehensions.

But, in the next place, what real ground is there for connecting together, in temperate climates at all events, the presence of forests and the frequency of rain as cause and effect? The assertion is so commonly made, that to doubt its truth seems almost like contradicting a received physical fact. And yet it will be found on examination that it really rests on no solid foundation, either of reasoning or experience. The question is a "proces juge et pas plaide." As for the reason of the supposition, none whatever has been assigned, so far as we are aware, except that a surface shaded with woods is somewhat cooler than one denuded of it, and therefore likelier to attract the passing shower. How far this may be true it would be difficult to verify, or whether a hundred acres covered with wood really present a cooler area than if covered with turnip or other vegetation; but the effect of such a cause as this must be very limited at any time, and (which is more important) it can apply only at the warm season of the year. In winter, when a full half of our rainfall takes place, the "open" is notoriously cooler than the shaded surface, and therefore should, by the supposition, attract more moisture. In cold countries—Canada, for instance—the woodman can ply his trade in the sheltered interior of the forest when out-of-door work is completely suspended in the cleared land by reason of extremity of cold. Supposing, therefore, the precipitation from the air to be in any degree affected by the presence or absence of forest covering, one-half of the year ought to balance the other.

In France, the prevalence of the theory that the clearing of woodlands diminished rain was such, a few years ago, as almost produced a panic among philosophers; and in France the question could be tried experimentally with greater ease than here, because the surface of that country is more markedly divided between thick wood and bare fields than is the case with ours. Something meriting the name of observation was therefore applied to the problem, and we believe we are right in saying that the result hitherto arrived at is altogether adverse to any connexion between the alleged cause and effect. Rainfall cannot be shewn to have diminished generally in France through the removal of forests, which in the last hundred years has been very extensive, nor can it be shewn locally that rain has diminished where forests have been cut down. One experimentalist compared for some years the meteorology of two adjoining valleys in Burgundy, the one covered with wood, the other enterely bare, and found that less rain fell in the former. But observation of this kind must no doubt be far more extensive and more prolonged to be really valuable, and none such has been applied since this question began to be agitated. Of course our scepticism does not in any degree touch the real and provable utility of forests in agricultural economy. It has not been shewn that they increase the rainfall, or any good reason given for supposing it, but they are of the greatest service in economizing it. They preserve the fallen water, both by the percolation which takes place more readily on the soil shaded by them than on exposed surfaces, and also by obstructing evaporation. They are most useful accessories both against flood and against drought. But, under our English climate, there is a contingency perhaps more injurious in the long run both to human health and the fruits of the earth than either flood or drought. This is the prevalence of damp, cold, sunless weather. Some suppose that an over-abundance of trees has a tendency to aggravate this particular evil. Certain it is, that in the vicinity of that very New Forest, of which the maintenance is now so strongly urged by some climatologers, a large number of the inhabitants who can afford it are apt to migrate in what they deem the unhealthy season—the fall of the leaf—and resort to a more bracing and invigorating air.

Not only the effect of forests, but the effect of modern field drainage, requires to be established on far more accurate evidence than has as yet been obtained. We do not mean its effect on climate in the general sense, which we believe to be none at all, but on the preservation and distribution of water, on the permanent productiveness of the soil, and on human and animal health. These are questions of which we shall have to leave the investigation to those who may come after us; for the present, we seem likely to content ourselves with deductions from very narrow experience, with very large conjecture, and very confident assertion.

ADULTERATION OF FOOD AND DRINK.

Read before the British Association by Mr PHILLIPS BEVAN, F.R.G.S.

LTHOUGH it is one of our most important
. social questions, the apathy and ignorance
the public on the subject of adulteration is
›nishing. As each person thinks that all
ers are mortal except himself, so he imagines
t adulteration affects any class but his own;
l although we acknowledge its prevalence,
l cry shame when we read of any particularly
l case, the sensation is but momentary, and
go on our way as before. What is adultera-
n, and what does it mean? It means the
ering of the physique of the nation, the
isoning of the people, the deterioration of our
nstitution; and, morally, a fraud practised by
: seller on the buyer, a cheating to which we
ve become so callous that it has hardened
r conscience for honesty in other and bigger
ngs. The great difficulty in dealing with it is,
it the Government is so slow to move; and
en men in high places practically defend it, by
claring that it is not so bad as it might be,
it the buyer must look to himself, and so on.
is also a very common argument that people
ng adulteration on themselves by buying such
y cheap articles—so cheap that they cannot
good for the money. But they do so in
norance; and if the seller was compelled to
el his goods with the names of the real ingre-
nts, such as "best butter mixed with starch,
shed potatoes, and horse-bone oil;" "coffee,
th bread-crumbs and sand;" "tea, with iron-
ings;" "sugar, with chromate of lead;" "beer,
th salt and cocculus indicus," it is not the least
ely that their cheapness would tempt the
yer; and if a certainty of detection and
nishment followed, we should find that the
llers would think twice before they offered
ch articles. It is strange that, in all our sani-
ry machinery, the food question and its purity
ve been so overlooked; but pure food is as
cessary as pure air, good drainage, or whole-
me water; and it ought not to be left to the
ilanthropist to remedy the evil, with the
lerable certainty that he will only get snubbed
r his pains. It is a Government question, as
portant as that of education or the Irish
hurch; and it ought not to be the duty of a
ivate member of the House of Commons to
ing in a Bill.

So convinced was I that no Bill could properly be passed without the knowledge of the legislation which prevailed in other countries, that the late Earl of Clarendon was applied to for permission to address the various British legations and consulates abroad on the subject. His lordship not only gave that permission, but evinced his great interest in the matter by requesting that a circular should be drawn up, embodying all the inquiries on food matters that it was desired to make. A thousand of these were accordingly issued through the Foreign Office; and Earl Granville, who has taken up the subject in the same warm and earnest spirit as evinced by his predecessor, has forwarded for publication in the *Food Journal* a mass of valuable information, which has never before reached this country. To detail even an epitome of these answers, would take up far too much of the time of this meeting. I will, therefore, only briefly touch on some of the main points of the circular, viz., "What legislative enactments at present exist in the country to which you are accredited respecting the adulteration of food and drink? Are these laws actively enforced, and how far do they appear to meet the evil?"

LAWS AGAINST ADULTERATION IN THE UNITED STATES.

Information comes to us from the United States, in Mr Thornton's report, which adverts to the difficulty of getting systematic information, even through the well-arranged machinery of official correspondence. The *State* legislation varies very much in the different States, some possessing no legislation at all, and others inflicting very severe penalties. Each State legislates independently; and, in so doing, often delegates the regulation of these matters to the various town or county authorities within their borders. As a general rule, the adulteration of alcoholic liquors is almost universal.

In Rhode Island, the penalty for adulteration of food, drink, and drugs, or for selling unwholesome food, is imprisonment up to six months, or a fine up to 200 dollars.

In Vermont, for adulteration of medicine, imprisonment up to two years, or a fine up to 400 dollars. For selling adulterated intoxicating liquors, from 10 to 300 dollars for each offence. For selling unwholesome provisions, imprisonment up to six months, or fine up to 300 dollars. For adulterating bread or any food with impurities injurious to health, imprisonment up to two years, or fine up to 300 dollars.

In Ohio, for adulterating spirituous liquors, a fine of 100 to 500 dollars, and imprisonment from ten to thirty days.

In Indiana, for adulterating any food or drink, a fine of from 50 to 500 dollars, and, at discretion of the court, imprisonment up to three months.

In Illinois, a fine up to 100 dollars, or imprisonment up to three months.

In Missouri it is a *misdemeanour*, punishable with imprisonment up to one year, or a fine up to 500 dollars; but adulteration of intoxicating liquors with strychnine, or any other injurious substance, is a *felony*, punishable by imprisonment from two to five years. Every liquor seller has to appear before the county clerk, and enter into a bond of 500 dollars, with good security, not to mix or adulterate his liquors with any material, not even water; the penalty for non-compliance is a fine from 50 to 500 dollars. There is also a very rigorous inspection and testing of all spirituous liquors imported into that State.

In Mississippi, adulteration is punishable by an imprisonment from one year to five years.

Cincinnati appears to turn its attention more to milk, for the sale of which the rules are extremely strict. Each milk seller has, under a penalty of 100 dollars, to have his milk inspected and tested, that it should not be watered, or the produce of diseased cows, or of cows kept in stables and fed upon garbage. The address of the dairy must be legibly painted on each stall.

In Georgia, every baker, brewer, distiller, grocer, merchant, or other person selling pernicious or adulterated food and drink, and also all accessories after the fact, are liable to a fine up to 1000 dollars, imprisonment up to six months, whipping up to thirty-nine lashes, and to work in a chain-gang up to twelve months.

In Texas, the fine for adulteration is from 20 to 500 dollars.

These laws generally work well throughout the States, but all the reports shew that there is generally a pretty high standard of reputation among the dealers, although it is, at the same time, true that the system of comprehensive laws, and the knowledge that they will be strictly enforced, tends to preserve this feeling.

PRUSSIA.

The Prussian Penal Code provides that any person selling adulterated or spoiled goods shall be liable to a penalty up to 50 dollars, or imprisonment for six weeks, with confiscation of goods. In these cases, it is not necessary that the seller be aware of the adulteration, for he is liable just the same. If death ensue, the seller is punished with death; but if only severe bodily injury, the penalty is imprisonment from ten up to twenty years. At Konigsburg, there is an additional law respecting the sale of damaged meat, and particularly of pork containing *trichinæ*. At Leipzig, the same regulations are in force, but the police are not active. At Hamburg, if any injury happens to the buyer, the seller is liable to be imprisoned for from three months to four years.

HOLLAND.

In Holland, the Dutch law is very similar to the Code Napoleon, and inflicts a punishment of imprisonment for from six days to two years, with a fine of from 16 to 500 francs. The adulteration of bread with copperas or vitoral is dealt with by an imprisonment of from two to five years, and a fine of from 200 to 500 florins. Not only is punishment provided for people who mix ingredients for adulteration, but also for those who manufacture or sell the ingredients, knowing that they were to be used for adulteration.

COMPULSORY LEGISLATION NECESSARY.

Any fresh legislation on this subject should be compulsory in its character, and not permissive. All articles of consumption which are manufactured should have their ingredients declared, for there is a feeling prevalent among manufacturers, as, for instance, cocoa makers, that as long as their articles contain nothing hurtful, they are at liberty to call them by the general name of cocoa. Still, a sophistication is to a certain extent a fraud, and every purchaser has a right to know what he is purchasing; and although we might be safe in the hands of the largest and most respectable manufacturers, there is a considerable class of unprincipled makers who are not above taking advantage. Differences of opinion sometimes occur as to the relative hurtfulness of certain common adulterants; and an eminent authority has assured me that he had grave doubts as to whether alum was not a good thing instead of a bad one. I would suggest, that there should be a Food Sub-department formed, which should take cognizance of all food legislation and supplies. To it a board of two or three of the most eminent analytical chemists should be attached, who should examine and pronounce upon all disputed chemical questions, and whose opinion hould be law. The Sub-department should ave the election of, and a certain amount of ontrol over, the county and borough analysts, whose appointment should be compulsory, and not permissive; neither should it rest with vestries or corporations, many of the members of which are often largely concerned in adulteraion. Inspectors should have power to visit and ake samples from all dealers in articles of food, subject to certain checks, so as to prevent any isk of tyrannical domiciliary visits. They should also have the power of testing the supplies furnished to public bodies, such as union contracts; for guardians have frequently a habit of accepting tenders for food at a price at which the real article cannot possibly be supplied, as a London Union Board did the other day in the case of butter. In cases where a petty dealer declares his ignorance that the goods which he sells are adulterated, I should make the onus of proving this fall upon him, and then it would be for the Food Sub-department to take the matter up, and prosecute the manufacturer. When adulteration takes place before importation, as in the case of the Maloo tea mixture, the department might well provide the machinery for setting consular and other influence to work, to prevent it; and might also step in as the proper arbiter between conflicting interests. In this very case, a great fraud on the public was allowed to go unpunished, because the Customs could not legally forego the duty.

As to offences, when proved, I am no believer in either a very small or a very large fine; but I would have no sliding scale at the option of the magistrate. For the first offence, the penalty should be sufficient to make the offender smart in his pocket; for the second, I would double it, and have an *affiche* detailing the offence put outside his door, as also outside the door of the church, police-station, and townhall, for a month. The case should also be advertised in the local papers at the offender's expense. For the third offence, there should be imprisonment for one month, with hard labour. Adulteration is either a fraud, or it is not, and it should be punished like any other cheating.

DISCUSSION.

Mr Rawlinson, President of the Health Section, after thanking Mr Bevan for his valuable paper, said —The probability was, that in the next session of Parliament some general measure would be brought forward, and the discussion that would take place and the papers read at the Congress, would, he had little doubt, have some weight and some influence in the regulation of any proposition which might be brought before the House of Commons. (Hear, hear, and applause.) The question of examining articles of food by qualified persons, was a practice not uncommon in this country, and in olden times there were such officers, and some of the charters existed even to the present time. The author of the paper told them plainly what Republican Governments could, and would do, if necessity required, for the punishment of the sellers of adulterated material. By this action, they would see that such Governments listened to the voice of the people, and were more severe than any despotisms in the world. No Government would attempt to administer such laws as were administered in the United States unless it was backed up by the great voice of the people. In France, too, adulteration was looked after much more severely and much more efficiently than in our own country. In Paris, for instance, there were officers who, having the necessary apparatus upon them, could demand to examine the quality of milk which a milkman might be carrying along the public street, and if, upon examination, it was found to be adulterated, the official did not hesitate to topple it over into the gutter. (Laughter.) There were some practices, in London especially, with regard to fish, which, if they were not, might be imitated very well by the fishmongers throughout the country. He need not tell the meeting that, during the summer months, fish was very bad to keep, and in no instance was the fish of the morning fit to keep over night. The large fishmongers finding this, dispose of all they can to their wealthy customers in the forenoon, and that which remains on their premises is offered to the poorer people at such a figure that it is eagerly purchased, and the vendors have therefore not the slightest difficulty in selling their fragments before eight o'clock. He was sorry that Dr Letheby was prevented from being present, because he would have been able to have given them some interesting information as to the meat and fish inspections under his supervision, and also his monthly or weekly records of the amount of fish and meat he was obliged to seize and destroy. He spoke, however, from his own personal knowledge and inspection, when he said that the meat seized was a mere fraction of that which was passed off on the community, and which, not having come under the supervision of some official, was consumed, bad as it was, in some way or another, by the population of the land. In his inspections throughout the length and breadth of the land, he had not even found one town where there were no men who dealt in meat that was entirely unfit for human food. They bought unsound meat at a small price; they bought cows which had died of the milk fever, and calves in such a state as not to be fit for food of any kind whatever. As an instance of what was carried on outside of the municipal boundaries of Manchester some fifteen or sixteen years ago, there was a row of about twenty slaughter houses, locally known as "slick butchers' slaughter houses." The meat dressed here was of the wors kind, and in conversation with one of those engaged upon the premises, he elicited the fact that it was all sent into Manchester to make soup, pies, and sausages. It was most repugnant to the mind to have to talk about such things. Assuredly, there was a great necessity for the Legislature taking up the question seriously, and they were all obliged, indeed, to Mr Bevan for having brought it before the meeting. He hoped, and he had no doubt all present shared the feeling, that something would be done in the future, and that speedily. (Cheers.)

Mr GODWIN was of opinion that the trade morality throughout England was only very indifferent, and the observation referred to all classes. If you bought a hat, you discovered that the band would not stand any pressure ; and in the purchase of gloves, they were often of no use in consequence of the small thumbs. (Laughter.) What could be more abominable? He answered, nothing ; because it was not anything else but barefaced robbery. He would have all such sophisticated beings punished so severely that they would not attempt to repeat their dodges again. A contractor sent out, they would say for argument, ten thousand pairs of soldiers' boots—they would recollect that the Duke of Wellington held that a good pair of boots, and an extra pair of soles, were the best materials for a soldier—and they might imagine the aggravation created, if, when these boots were unpacked, they were discovered to be of that leather which sipped up the water, and were in reality simply destructive instead of effective. This was no overdrawn case, and no punishment could be too severe for such men. (Hear, hear, and applause.) Another not uncommon instance was, as to life belts. A sailor, who can ill afford the cost, purchases a life belt which he sees hanging over a shop door, and the chances were that it was stuffed with hay instead of cork, proving, in an unfortunate hour of danger, a death belt, rather than one to assist in the saving of life. Taking all those matters into consideration, he would heartily support any petition for legislation which the meeting might think fit to adopt.

Sergeant COX, while heartily smypathizing in the movement, called the attention of the section to the practical difficulties arising in the enforcement of the law upon the question, in order that they might also discuss the best means of overcoming them. (Hear, hear.) They would all agree that adulteration was a very bad thing indeed, and it was most desirable to get rid of it as best they could, but the difficulty of the subject was how to do it. Two questions presented themselves in following up this argument—First, What law they could make by which the difficulty could be met ; and secondly, How that law was to be enforced? This was not a new thing to our Legislature. There was on the statute book of England at this moment an Act providing against adulteration of food. This Act was a very elaborate one, and was attended by very elaborate machinery, and they were now told that that Act was imperfect in many particulars. They certainly had this remarkable fact, that although the Act was passed ten years ago, not a single conviction had taken place under its provisions; while, on the other hand, adulteration had gone on to a greater extent than before it came into operation. What did they learn from this? That there seemed to be some serious difficulties in its enforcement. They had had a most interesting statement with respect to the provisions made in other countries. They had heard of the severe laws of the United States, and of the more severe enactments in Prussian and other European continental countries ; but he would have liked Mr Bevan to have gone on telling them something about whether those laws were enforced, and if they had been enforced, with what effect that enforcement had been attended. All experience in this country went to shew that very severe laws generally defeated themselves, and he was thankful to state that we had not got in this country that despotic power for the enforcement of laws that they had in other countries. If a law was passed regulating the adulteration of food, it would have to be decided whether its enforcement was to be made by summary conviction before magistrates or by a jury. If it was decided in favour of summary conviction, then the magistrates, by the enforcement of penalties, would create such a feeling of dissatisfaction amongst tradesmen, that the end of it all would be, as it had been with the law now in existence, that the fines would not be enforced at all. The difficulty, however, did not finish there, because British magistrates must be satisfied beyond all doubt of the guilt of the offender before they inflicted a penalty. Another difficulty was as to whether the original adulterator or the vendor of the adulterated article was the person liable. They would allow him to say, in conclusion, as a man of practice and experience in the administration of the law, that he believed the only solution of the difficulties was to be found in the destruction of all adulterated articles when discovered, and he argued that this would be more efficacious in procuring the desired end, than the making of any elaborate law and the infliction of severe punishment.

Dr STEPHENSON MACADAM, of Edinburgh, did not think that in Scotland they had arrived at such a pitch in the adulteration of material as appeared to be prevalent in England, but it was quite possible that the offensive practice might become much more rife with them than it was at present. There were, however, a great many articles he had found adulterated more or less, although he must say that the number of instances had not been so very great. On one occasion, he tested some flour, and he found it to contain twenty-five per cent. of chalk; and on another, he discovered a biscuit to be made of fine bone-ash instead of flour, but it was only right to state that the latter was a mistake. He was once asked by a large firm to analyze a bottle of port wine, and found it to be strongly adulterated with logwood and cane sugar. So far as butter was concerned, it was not an uncommon

› find it adulterated with lard and tallow, and
ıer of these were injurious qualities, he thought
: came as near as possible to the disputed line
teration. In regard to milk, he had never
tered those horrible things said to prevail in
-called commodity supplied to the people of
ı, but it was not an extraordinary thing to find
rater in it. (Laughter.) But then came the
n whether that water had been added to the
ıfter it had been obtained from the cow, or
:r it was rendered more of a watery nature
to the feeding of the animal. Mr Macadam
greed with the previous speaker, that the difficul-
the way of the enforcement of the law were very
but he was not prepared to suggest a remedy.

HOLLAND remarked that the members of the
ion to which he belonged were inclined to think
e best plan was to pass a law forbidding adulte-
and leave the administration of its provisions to
properly qualified for the purpose. He con-
that in all cases it was the business and impera.
ıty of the vendor to ascertain whether his goods
of a really genuine character or not, just the
ıs it was the duty of tradesmen to see that their
s and measures were according to the standard.
latter condition was not complied with, the
:rs were fined, and why not enforce a penalty on
ler of adulterated articles, for, he maintained, that
o cases were analogous? The other day he saw
hine which had been made for the moulding
:kory into the shape of coffee berries, and the
nan who sold the latter for pure coffee was
ıly guilty of gross carelessness, and ought to be
ed. It was not to be supposed that if a doctor,
;h carelessness or some mistake, killed his
t he was not to suffer for it, and that being so,
ired to know why a tradesman was not to be
lled to use proper precautions the same as a
ın. The adulteration of drugs was another im-
ıt matter, for the patient might be supplied with
in a certain quantity from one shop which were
wingly adulterated, and if it was thought desir-
ɔ change, and drugs which were genuine obtained
another establishment, and administered in the
quantity, the result would prove fatal. It was
said that a tradesman was compelled to keep
:rated articles, to sell at the same prices as his
bours, in order to keep pace with him, and that
uld not dispose of genuine articles at a profit,
f this were so, the sooner some measure was
d for the protection of the honest dealer the
it would be for society at large. In conclusion,
ongly advocated the appointment of paid officers
tch over the interests of the public in matters of
:ration of food, drink, and drugs.

FARR expressed his indebtedness to Mr Bevan
e paper he had read, but thought exaggerated
as prevailed as to the extent adulteration was
d on, and could not accept the presumption that
majority of tradesmen were dishonest. On the
ary, he believed the majority of tradesmen were honest, and therefore the greatest sufferers from the practice of their adulterating brethren, because they undersold them. For instance, the man who sold tea from the famous lot which was found to be adulterated with rice husks and straw, rice blackened with plumbago, silk-worm droppings, tea leaves and maggots, iron filings, fragments of limestone, minute seeds, fragments of willow leaves, and husks, would be able to undersell his neighbour. But whether the evil was great or small, he thought the remedy should be sought rather by exciting emulation among the tradesmen, than by repressive measures. Upon the tradesmen should fall the onus of proving the soundness of his goods; the duty of the town authorities ended in this respect with the appointment of a competent analyst. The machinery necessary for local authorities to determine the quality of every article brought into the market would be immense, and the attempt to work it would prove its impracticability. He therefore suggested that every local authority should be urged to appoint a competent analyst, to whom any tradesman in the town could go, and, for a small charge, have his goods tested. Such an officer had been found very useful in Birmingham, and he believed Newcastle had the power to provide one for itself.

The MAYOR remarked that they had no analyst in Newcastle except for gas and water.

Dr FARR said the extension of the principle would be found very desirable, because a great deal of adulteration was practised simply from the fact that the tradesmen did not know and could not ascertain the quality of the articles they sold. A druggist should be able to test all the articles he sold; but, except in cases of members of the Pharmaceutical Society, this was seldom so. The inability of other tradesmen to test their goods could not, therefore, be a matter of great surprise; but if an analyst were at their service, all honest men would be glad to take advantage of his assistance. The difficulty of procuring convictions in adulteration, pointed out by Mr Serjeant Cox, should not deter reformers; otherwise, detection of crime, including burglary and murder, must cease.

Mr HANCOCK remarked that summary punishment was necessary, without the chance of procrastination by appeal. He did not attach much value to analysts' certificates, because, although they were the result of examination of samples, they were used to puff any quantity of the whole and future consignments.

Mr BEVAN said the sympathizing tradesman was the great obstacle, but was sure a strict enforcement of the law would create a pure public opinion.

Archdeacon HAMILTON suggested that an analyst should be appointed, who, for a small cost, would certify to the quality of goods, and tradesmen would vie with each other in buying goods of pure quality, in order to get the analyst's certificate.

Resolutions were come to urging local authorities to appoint analysts, whose duty it should be to examine food and drink at the instance of purchasers, and recommending the Council to take steps to secure an amendment of the law.

Farm Implements and Machines.

TRACTION-ENGINES.

WE are indebted to the *Times* for the following:—The War Office authorities have for the past fifteen years gone through a long series of experiments with the Boydel and Bray traction-engines, with a view to their applicability to military purposes; and although for a short time surprising results were obtained from these engines as regards their power of hauling wherever there was a good road, still they were found to possess so many inherent defects, both in construction and working, as led to their ultimate failure and abandonment. These engines were, nevertheless, in the right direction; they were the first round in the ladder, and led to the immensely more perfect development of the present day, and production of an engine that will not destroy itself rapidly, with great power of haulage, gentle and soft in action, easy upon the roads, and at the same time economical when compared with the use of horses. All these properties the new "road steamer," or traction-engine, invented by Mr R. W. Thomson, of Edinburgh, possesses in a high degree, this fact having been established by a series of most exhaustive trials and experiments made by Messrs Anderson & Bailly, by order of the War Department, resulting in a full corroboration of its efficiency, purchase of engines, and establishment of a corps of drivers and stokers. The last trial of the engine in question was made at the Royal Arsenal, Woolwich, in the presence of a number of gentlemen who have manifested considerable interest in this invention, which no doubt will prove of incalculable advantage and importance. Among those invited to witness the trial were Sir H. Barclay, K.C.B., General Ripley, Professor Archer, and Messrs Coode, Jarvis, Phelps, Bisset, and Thompson. The trials were made under the direction of Mr Anderson, Controller-in-Chief of Machinery, and were of such a nature as fully to establish in the minds of those present the fact that the question of steam traction on common roads is now completely solved, and that it opens up beyond doubt an entirely new field for steam transport conveyance.

BRUISING OR CRUSHING MILLS.

OME years have now passed since the importance of the principle of bruising rushing grain for feeding purposes was insisted upon, and every day's experience e then has proved its practical value, ecially in the feeding of horses. In ng to these valuable animals bruised oats, ground into meal, has resulted, in a large ber of cases, in effecting a very consider- saving. This branch of agricultural ctice has brought into prominence the hines by which the bruising is effected, we have now in the market several fine mples, which do their work well. The est form of bruising mills was simply use of two rollers of equal diameter, plain—turned on their peripheries. It soon discovered that this arrangement defective, and a slight improvement was cted by grooving the surfaces of one or h of the rollers, the grooves being placed allel to each other, and running in the ection of the axis of the roller; but it was till the differential movement was re-organ- l that the bruising-mill became thoroughly cient. In the bruising or crushing-mill of Messrs Turner, of Ipswich, the rollers ployed are not of equal diameter, but a ler of large diameter revolves in near con- t with another of smaller diameter. In old mill above referred to, of two equal metered rollers, the mode of applying the ssure gave rise to difficulties in working, l there was also a difficulty in obtaining proper degree of crushing effect, in con- uence of the defective relative proportions the two rollers. In Messrs Turner's mill, arrangement for giving the pressure and regulating the distance between the rollers, t once simple and effective. The pressure applied and regulated by a screw acting on springs, these springs being connected th, and acting upon, the bearings of the all roller. The springs have a double rpose to serve; they not only ensure a uniform pressure, but, by their elasticity, they give way when any large or hard substance, such as a stone, is present in the oats, &c., to be crushed or bruised, so that the distance between the rollers is at once increased, and the stone allowed to fall through. Both the small and the large roller is provided with a scraper, which, acting upon its periphery, keeps it clean and free from all adhering matter, and thus maintains, in its integrity, its bruising surface. This simple contrivance is of great practical importance, as it is obvious that any substance adhering to, and projecting from, the surface of the roller or rollers, must decrease their bruising action. The hopper into which the oats, &c., to be bruised are fed, has, at its delivery spout, or neck, a small roller, to which a motion of revolution is imparted by means of a driving belt from a pulley on the main driving axle; this roller serves to distribute the substances to be crushed uniformly to the crushing rollers. The regularity of the feed or supply of oats, &c., to the rollers, is insured by a small slide or hatch at the delivery neck of the hopper, which is worked out and in by a small rack and pinion, the spindle of which has at its extremity a small hand-wheel. We need scarcely say that this mill, in all its parts, is made with the accurate mechanical adjustment and finish which are the characteristics of the eminent firm to whose ingenuity the mill is due.

The differential movement, to the value of which we have already alluded, is carried out most efficiently in the bruising or crushing mill made by the celebrated firm of Richmond & Chandler, of Greengate, Salford, Manchester. In this machine, which, it is almost unnecessary to state is made with all the care and accuracy which distinguishes the work of this firm, the rollers are grooved, but the grooves are not made parallel with the axis, but run in an oblique or diagonal direction across the surface.

We believe this diagonal arrangement of the grooves has a most important and beneficial influence upon the crushing and bruising effect of the rollers. It is a very difficult thing to explain the effect of this diagonal grooving, suffice it to say, that the grip of the groove upon the substance to be crushed is greatly increased, and the efficiency of the crushing or bruising principle is greatly aided by the way in which the substances to be bruised are taken up and acted upon; this arising from the double motion given to the substances to be crushed, a motion at once in the direction of the length of the rollers, and also in the direction of the diameter or line of revolution. In rollers with parallel grooves, or surfaces not grooved at all, the movement of the substances as they are crushed is in the direction of motion of revolution, and the period during which they are subjected to the crushing influence is proportioned to the speed at which the rollers revolve; the faster they revolve, the shorter is the space of time under which they are subjected to the crushing influence, so that, on the one hand, if speed of working is aimed at, efficiency of crushing is lost; while, on the other, if to give the crushing effect as long a time as possible to operate, the speed of crushing, or the work which the mill has to do, is lessened. But, by giving the grooves of the rollers a diagonal direction, the substances to be crushed are subjected to a lateral or side motion, in the direction of the axis of the rollers, from the tendency of the grooves to thrust the substances aside, and thus prolong the crushing effect, while the rate of revolution of motion of the rollers, tending to move the substances forward, and to pass them out from the mill, remain the same; and the differential action is increased by setting the rollers in such a way that the grooves, or the direction in which they run, are in opposite directions, the result of which is, that the angles of contact are always varying, so that the crushing or bruising effect is greatly increased. We have for long advocated the value of a differential movement in machines where a bruising, or disintegrating, or bearing-up action was desiderated, not only in machines of the steading, but in the implements of the field, by placing the moving parts diagonally, it is with pleasure that we have observed its gradual adoption.

The Farm.

LINSEED CAKE AND HOME CONDIMENTS.

ERE is no manufactured article for food that is used to a larger extent by ckowner than linseed cake, and with nually increasing consumption the f the commodity has also increased. creased demand has led to an un- ome competition, and the pure cake is rocurable from a few firms. Till within st twenty years the farmer had no to complain of the adulteration of nous feeding materal. Our chief sup- re obtained from Russia, but since imean war, dodder, rape, millet, and indigenous weeds have been mixed e pure linseed. A large part of the ties may be removed by screening and from the real seed, the spurious seeds for the most part, smaller in size. This reduction in quantity of 10 or 15 per nd the enhancement of the price of ainder. Many of our oil-crushers add mixtures in the process of manufac- and this is done in order that their may be augmented, and that they may he requirements of the farmer, who ave everything cheap.

it should not be forgotten, that h linseed cake is the best of all feed- fs, there are other valuable substances d in making a good mixed cake. are many valuable herbs and plants in sture fields, which, as an admixture, the feeding and fattening qualities of ep. We once thought otherwise, and ving roots in the rotation, we were ously careful to extirpate every weed, r to give the cultivated crops the whole le possession of the soil—which was, a most important point in producing rops; but we had the ulterior object also, that when laid down with ryegrass and clover for depasturing with sheep and cattle, there should be nothing but the ryegrass and clover plants in the fields. We were congratulating ourselves one day on our success, when contrasting one of the fields so treated with a contiguous field belonging to a neighbouring proprietor, where weeds luxuriated without molestation, and were bold enough to draw the attention of the occupying owner to the contrast. He very properly asked us to step over the march fence, and see and judge for ourselves. Portions of the pasture were eaten quite bare, one might have picked up needles from it, as the saying is; and the parts where the cultivated seeds prevailed offered a full bite for the browsing animals, and presented a cover that would have pleased the most rigid game-preserver. In the former we could trace plantago, centaurial nigra, dandelion, and other spurious plants as they are regarded in common estimation. "Now," says he, "taking the preference of my beasts as the test of the nutritiousness of the several herbaceous plants, the weeds or trash, as you are pleased to call them, must have a flavour that makes them agreeable, and a purpose to serve in the sustenance of the animal." The question of selection was still more apparent when the edging along the hedge was compared with the rest of the field. This may not be held as a safe criterion by which to determine the point at issue by some, but the generality of graziers entertain no doubts on the subject.

"Did you ever see a lot of cattle in a field of growing corn eat the straw and leave the corn?" was the quick rejoinder of the owner of an extensive herd, when the problem was put before him. Analogous cases crowd in upon the observation and experience of the stockowner at all hands. There is, for example, a worthless plant called ragwort or bindweed that infests the richest and driest pastures of our island home, and which is justly regarded as an indication of the goodness of the land; now this plant, while young, is eagerly eaten by sheep, and it must serve a purpose in the animal economy, for they thrive well on it. Now, it must be conceded that many admixtures, or adulterations if you will, do not impair the quality of the compound. Some of the indigenous wild plants referred to are very much allied to, and in some cases identical with, the materials employed by the cake manufacturer in preparing his mixed cakes. We have got flavouring and condimentary substances without number, which are used by the owners of the best herds in the country; and the main question with the stockowner is, to obtain alimentary feeding stuffs free of pernicious ingredients, on good terms and at a remunerative value. We are no advocate for adulteration, in the bad sense of the term, for our motto would be that of the merchant, who, when accused of adulterating his teas, replied that he adulterated with the best only. It may be alleged that this line of argument opens a wide door to unprincipled manufacturers, and the assertion is specious; but, after all, it must be recollected that the consumer is dependent on the integrity of the manufacturer; and surely the world would be sunk to a lower pass than it has yet fallen to, if all trust between man and man were banished from the earth.

The weak point in the circulars of many of those who profess to manufacture pure linseed cake is, that nothing is said of the amount of fatty matter therein. The same remark applies to brokers and agents. The percentage of oil, which is the fat-producing quality, is, we think, as much an element of value as the absence of an excess of extraneous matters. The mere amount of oil, *per se*, is not decisive, if rape and other oily seeds are among the constituents. An approximate opinion may be formed by the aid of the microscope in the one case, and by the tests of the chemist in the other. Some, however, do publish the chemical composition of their cakes; but none, so far as we are aware, tell what foreign ingredients are compounded with their cakes. With a close ocular inspection and an analysis, a farmer possessed of ordinary judgment may purchase on terms more satisfactory to his own mind than otherwise; and he cannot be far cheated, for, on proving the quality, he can again purchase the same brand.

Upwards of twenty years ago, Professor Way, Consulting Chemist to the Royal Agricultural Society of England, published a valuable paper on the composition of linseed cake. The late Professor Johnson, Professor Anderson, and others, followed in his wake, and it would be a great boon to the farmer and consumer of oil-cake if their investigations were re-produced. Fair samples of linseed contain on an average 35 per cent. of oil, and 9 to 10 per cent. of water; but the quantity of oil yielded on the large scale may range from 22 to 28 per cent., the remainder must be looked for in the cake, which will be regulated by the amount of pressure employed, and the original quality of the seed. Crushers have the most substantial reasons for squeezing out very thoroughly a great quantity of oil, for though good cake sells at £12, the linseed oil commands upwards of £30. The oil in the composition of the cake ranges from 8 to 13 per cent. It is not, however, the only valuable ingredient in the cake. The nitrogen which is associated with the albuminous matter may amount to about 4 per cent., and is the root of the feeding qualities of cake. Good cake contains 6 per cent. of mineral matter, and if it exceed that, dust, dirt, and sand may be looked for. No inconsiderable value is attached to the ash, the preponderating ingredients of which are potash, magnesia, and phosphoric acid. A trace of that invaluable condiment common salt, is shewn in all the analyses that we have seen, a substance that is indispensable alike in all animal and vegetable life. It is a notable fact that rape-cake is almost identical in composition with linseed cake, although it may be bought at half the price of the other.

There is no doubt that cakes of all kind are more economical than grain, and they contain a larger amount of flesh-forming and fat-forming ingredients than corn. Another benefit arising from feeding cattle on substances containing a fair amount of nitrogen, is the increased value of their excrements. A diet of various constituents has been our regimen for the sustenance of the bodily frame, and the same policy carried out in the conduct of our flocks and herds, we have, after a long experience, found most profitable. We have never therefore been particularly strict in relation to the *purity* of the special substances used, provided they contained no injurious mixture. Many farmers north of the Tweed prefer giving the very finest linseed cake alone to cattle finishing off for the shambles; but in ordinary circumstances, and at the present quotations of the different kinds of oil-cakes, a compound of them would leave a larger margin of profit to the feeder than the high priced cake.

"*SOUR KEEP*" VERSUS *HAY*.

IN Austria, and in many other parts of the Continent, it is a common practice to store away in pits, and convert into so-called "sour-keep," fodder-crops, which, owing to unfavourable weather or other causes, cannot, without sustaining great loss and injury, be made into hay.

Not only the aftermath of grass, and second crop of clover or vetches, but turnips and potatoes and their leaves, as well as the leaves of the cabbage, of the vine, and of many kinds of trees, are all preservable by the above means; and, if properly treated and husbanded, may be relied on to supply the farmer with a succulent winter food for his stock.

No better method exists also of utilizing the refuse of sugar and starch manufactories, and of protecting from further decay slightly-frosted root crops.

The mode of procedure is exceedingly simple, and attended with less expenditure of time and trouble than is the making of good hay. The pits intended for the reception of the sour winter keep should, if possible, be dug in a dry, not very permeable soil; one free from ground-water. It will be found advantageous to make them of a considerable size, as the green food then keeps better, and the cost of covering-in comes less expensive. The walls should be quite perpendicular, so that the food may settle down evenly.

The usual dimensions are 20 feet in length by 8 in width, and 5 in depth; but where the holding is large, and much stock wintered, these figures might be increased. In cases in which the process of acidification is resorted to every year, it is worth while to wall round the sides, and floor the bottom of the pit with stone or brick.

The preparation of sour-keep takes place as follows:—One labourer throws the green or slightly withered mass (cut grass, clover, &c.) from the cart into the pit, where a second spreads it out in layers, and four or five others stamp it down as firmly as possible.

The layers should not exceed 1 foot in depth, otherwise they cannot be pressed down properly. The sides and corners of the pit must be specially looked to. To avoid hollow spaces, and admit but little air, are the great points requiring attention.

The air contains, of course, oxygen, and the latter, if present in any quantity, spoils the keep by causing it to become mouldy. For this reason, the practice of lining the pit with straw should never be permitted. The air cannot possibly be excluded from the straw, and the adjoining portions of the green food turn mouldy, and are then unfit for anything but litter.

The pit being full, several loads of green food are piled up on the top, so as to form a pointed roof, and then follows a covering of earth 2 or 3 feet thick, supplemented by one of straw. The work of storage is then complete. Some farmers sprinkle salt on the different layers of fodder; but as cattle will eat the "sour-keep" readily without this addition, it is quite unnecessary. Indeed, the salt—added partly to assist in preserving the mass—does more harm than good, by retarding the lactic acid fermentation (which must take place), and by rendering the underlayers of the keep, to which it gradually sinks down, too salt.

It also increases the laxative tendency of the turnip leaves, &c., and, according to the experience of many agriculturists, loosens the teeth of cattle.

In about six weeks' time the fodder will be found to have sunk about 1 foot, and it will continue to sink till it occupies but half the space it originally filled.

According to Blascovitz, of Hungarian Altenburg, the diminution in volume and loss of material caused by settling, amounts, in the case of Indian corn, to 60 per cent., and in that of mixed green food it may be estimated to average 40 per cent. This settling of the pit's contents is naturally accompanied by the falling in in places of the roof, and care must be taken to fill up the cracks and inequalities as soon as they appear [illegible] again [illegible]

Fermentation, which necessarily raises the temperature of the green food for the time being, gives the latter a peculiar, penetrating, sour-crout-like scent, which, though sometimes disagreeable to man, is never repulsive to farm stock.

In a general way, full-grown cattle eat the sour-keep with avidity, preferring it to most other kinds of food, and calves only a year old soon learn to like it. To the former, as much as 50 lb. a-day may be given.

Should lactic acid be present in any considerable quantity, it may cause the fodder to act as a purgative, and even bring on diarrhœa; on the other hand, when occurring, as usually happens, only to a slight extent, it is a useful agent in promoting digestion.

As regards the effect of sour-keep on the secretion of milk, no fear need be entertained. The yield will be found satisfactory, both in respect to quality and quantity; and to judge by the butter, one would suppose the cows to be feeding on rich pasture.

One of the chief advantages of the sour-keep system is, that the crops can be harvested and stored away at any time of the day or year, or in any weather. If pits have been dug ready for their reception, the farmer may regard with comparative indifference the fall of the barometer, and the lowering aspect of the sky. He knows that he has only to make sour-keep instead of hay, and not a leaf, not a flower (an important matter in the case of clover) will be lost or spoilt. The toughish, woody stems of the plant become as soft and juicy as the tenderest [illegible] the whole mass is pervaded by [illegible] aroma, that cattle rarely [illegible] their provender uncon-

BEETROOT AND SAINFOIN—FOUR-COURSE FARMING.

THE Ixworth Farmers' Club has inaugurated its autumnal meetings with a paper read by Mr Matthew, Knettishall, on "The Growth of Beetroot and Sainfoin in connexion with the Four-Course System of Farming." Mr Matthew chose this subject because he deemed it a most appropriate one at a time when the members of the Club were sufferers from the heat and drought of three seasons; and when their experience told them that it would be a good thing if they could devise some plan by which they could make themselves more independent, in future, of artificial grasses, clovers, &c., while they secured a good beetroot crop. Another reason Mr Matthew had for wishing some new method of farming, was a reduction in the expenditure for artificial manures and feeding stuffs; and a third reason he put in the form of a query, viz., Whether it was not possible to increase the quantity of stock upon our farms without much diminishing the area of corn? Any new plan, however, for attaining the end in contemplation, must, he reminded his audience, be based upon the four-course system of farming, as from that rotation scarcely any farmer in Suffolk could deviate.

The four-course system is, in that county, as unalterable as the laws of the Medes and Persians, and he would be a bold farmer who would suggest an innovation to the landlord. All that Mr Matthew says is, that he "*thinks* it one of the evils of farming." Could he not have said he was *sure* that all regulations compelling agriculturists to follow a routine course year after year are at times often prejudicial to the tenant, and in no way beneficial to the owner of the soil. A man who knows his profession, who can note the changes in the character of seasons, who is responsible for the rent of the land under any weather or epidemical disasters, well understands also that to impoverish the land is to pick his own pocket. It is unfair to such a man, therefore, to hamper him, as Mr Matthews says he is in Suffolk. There, we are told, "when a man hires a farm, his landlord, in a great measure, farms it for him." But the landlord is not responsible for the mistakes that may be made in particular seasons. The loss accruing through these falls upon the shoulders of the tenant, and most landlords do not relieve the burdens with one of their fingers. There are, indeed, proprietors who nobly and generously share in the losses greatly due to their own restrictive lease clauses; but, like angels' visits, generally, they are too few and far between. This binding by legal enactments must, of necessity, as Mr Matthew says, "check that spirit of enterprise without which no business can succeed, nor can anything new be brought out."

Mr Matthew by no means objects to the four-course system *per se.* That has proved, as a standard of guidance, very valuable. "It has stood the test of ages, and when other systems have failed, it has been found to succeed." But, without disparaging it in the least, what is wanted—what, indeed, is imperative for thoroughly successful cultivation—is that farmers should have more latitude; that neither the four-course system nor any other method of culture should be absolute under any circumstances or conditions. Farmers pay their money for the land, and they ought to have their choice in the manner in which they crop it.

We give here, in Mr Matthew's own words, his ideas as to what we should do under such concatenation of circumstances, to the disadvantage of farmers, as these dry summers imply:—

1st. Then, these dry summers, what are our wants? How best supplied? Taking a retrospective view, the first difficulty we had to encounter in the spring of 1868 was the difficulty of obtaining a plant of beetroot. The months of April, May, and June being so hot and dry that none of us could get a plant but those who were fortunate to have their land cultivated in the autumn, and the seed drilled by the middle of April. The next difficulty of that year was, what were we to give our stock, and how to fill our stackyard? From want of rain the crop of clover was very short, also the mixed grasses. The only fields that did well were those planted with sainfoin. Then the season ended by our discovering immediately after harvest that all our young layers were dead, and we must either have gone without sheep the next season, or been at the expense of drilling them over again. I will now describe what I tried myself, and the results. Upon one field of 40 acres I drilled 2 pecks per acre of common ryegrass, 2 pecks per acre of Italian ryegrass, ¼ peck of trefoil, ¼ peck of white clover, ¼ peck of ribgrass. The result of this was, it came up well just after the first shower, but the drought and sun again set in, and the trefoil and suckling all died off, but the ryegrass and ribgrass kept alive, and although it produced but little food in the early part of the following spring, it made good feed in the summer, and my sheep and lambs settled upon it better than on any other field. I also tried a mixture of Italian grass, ribgrass, and tares: 1 bushel of winter tares per acre, 3 pecks of Italian grass per acre, ¼ peck ribgrass per acre. This mixture did well, and produced a capital piece of early feed with the tares and grass, and the ribgrass and ryegrass made some after-feed, and produced a good flag for the succeeding crop of wheat. I cannot say I prefer ryegrass as a preparation for wheat, but upon our light lands it is better than nothing at all, for upon this field I had not sufficient ryegrass to finish the field by 3 acres. I therefore drilled it with the tares without the ryegrass, and the wheat crop was this year at least one coomb per acre more where the ryegrass was than where there was nothing at all. On another field I sowed 1 peck per acre of trifolium; this I mowed for hay, had a fair crop, and my horses were very fond of the stover, but the wheat this year was very light after it. The best crop again on my farm was the sainfoin; indeed, the only crop that did not suffer from the drought. Looking back to the year 1869, the plant of clover and young seeds after harvest was so good that we all thought this summer there would be no lack of feed, but what has been the case? The drought and sun have again been too severe for our layers of one year's growth, and keep for stock has not been so abundant as it was last year, with only the half plant of layers that were left us. Tares, also, were a partial crop, and we have again had the same difficulty in obtaining a plant of beetroot, and only in those fields that had the autumn tillage is there a plant. But the sainfoins of two and three years old have again done well, therefore proving that plant able to stand the severest drought, and now we have again lost our young layers, all but the sainfoin. I have again drilled over 60 acres as follows:—½ bushel per acre of Schrœderii brome grass, ½ bushel of Italian peas per acre, ¼ peck ribgrass per acre, 3 pecks of red suckling. I have not used any trefoil or white clover, my previous experience being that it was useless. I also intend drilling this week one field with tares, 1 bushel per acre, and ¾ bushel Italian grass. And as I have now 70 acres of sainfoin, of very good plant, I feel less dependent upon the success of this late feeding than I should otherwise have done; and I will now ask you to follow me as I describe my system of growing beetroot and sainfoin upon my farm; and I hope you will give me your opinion of its merits, and offer such remarks as may strike you as to its general adaptation to this neighbourhood. I will suppose, then, in the first place, I have 500 acres of arable land in my occupation, and I think it right to grow 20 acres of beetroot in each year, the plan I pursue is, I take beetroot after barley—*i.e.*, not laying down 20 acres of the barley shift with small seeds. As soon as wheat sowing is completed, I plough in the barley stubble a good deep earth—say 9 inches; then as soon as the land has been acted upon by the weather, I harrow and ridge up, about the New Year, or earlier if I can; then in March or April, as the weather permits, I manure with—say 14 loads per acre of farm-yard muck, ¼ of a ton per acre of rape-cake, and 2 cwt. of salt, drilling the seed not latter than the middle of April. This beetroot will be followed by wheat. In the succeeding spring I drill in the wheat sainfoin, rather over one coomb per acre; this sainfoin I intend to lay three years, to be succeeded by wheat, in course with the remainder of that shift, thus making the beetroot and sainfoin fit in with the four-course system. Perhaps some will say I am losing sight of one of the heads of my subject, in making use of such a heavy dressing of manure for beetroot; but I would go further, if rape-cake could be bought at £5 per ton. I would use ½ a ton per acre, and taking into consideration that this field is to have no more manure for four years, I think you will say the dressing is not excessive. The course will be—1st, Beetroot after barley, instead of layer; 2d, Wheat after beetroot, in course; 3d, Sainfoin after wheat, instead of turnips; 4th, Sainfoin, instead of barley; 5th, Sainfoin, instead of clover, &c.; 6th, Wheat after sainfoin, in course. I should thereupon have 20 acres in each year to lay down with sainfoin, and 20 acres of three-year-old sainfoin to come up for wheat in each year; and if I succeed in getting a plant of sainfoin, I should always have 60 acres of sainfoin, of three different ages growing on my farm. Again, taking beetroot after barley, you save the autumn tillage of the land. The land after barley is in a very different state, and does not require so much labour to bring it into a good tilth as after wheat; the preparation for wheat being to get the land together as much as you can, the preparation for beetroot being to leave the land as light as you can. Again, taking beetroot after barley enables you to clean the land well before laying it down with sainfoin, which is to lay three years, and upon this will your success mainly depend; and, as practice is han theory, I have succeeded in obtaining a nt of beetroot during the last three years grown way.

ve heard some say, "A penny earned is as s a penny saved," but I am inclined to think e penny saved is the best, inasmuch as the a penny incurs no risk, when the earning a must. And when the labour and seed ques- tested in connexion with this plan of growing ot and sainfoin with the ordinary four-course, ll find a great saving will be effected. What n be the value of these crops upon this 120 acres so treated, against 110 acres under the four- ? The next thing I should like to introduce for onsideration, is the different sources of manure e at hand upon our farms, or its equivalent: mes the manure from stock; 2d, rest is equi- to manure; 3d, shade is the same; 4th, tillage y land is the same; 5th, succession of crops is e same. We all of us know that stock can be on our farms without limit, if we put our hands pockets for purchased food—but will it pay? lf way. One-half from the pocket, one-half he green crops of the farm; therefore, if we increase our manure supply from this source, st increase our green crops to make it profit- Rest to land is equivalent to manure? When laid down to herbage, the future vegetation it produces, tends, by its decomposition, to te the productive power of the soil. Land in te is said to be in rest, therefore will not the ears' sainfoin be a source of manure? Shade equivalent to manure. We are all of us aware rop of clover mown for hay is a better pre- n for wheat, than if the land is fed bare by luring the summer months, more particularly ight land; also, upon heavy land a stout crop s is considered a better preparation for wheat poor thin crop of beans; also, a good thick f mustard is better than a light one, as a pre- y crop; also, upon our lands when we feed our vith clovers we find it better, as a rule, to apply ssing of farm-yard manure that we intend for eat crop before harvest. Does not this prove e land shaded from the sun is better than if d to its influence? Therefore, may we not infer that shade is equivalent to manure? to heavy land is equivalent to manure. We ow that a well-cultivated field of heavy land, t manure, would produce a better crop than a ill-cultivated land with manure. Succession s is a source of manure. All plants grown and off the ground must necessarily tend to exhaust l; but plants which are grown and suffered to or consumed by animals upon the land, do not t the soil. Some crops prepare the land for f a different kind, taking out of them certain sities, and leaving certain deposits behind, y rendering the field more kind for a succeeding some other species. For instance, we all of ow in practice that a crop of clover without manure is a better preparation for wheat than a pea stubble with any fair amount of manure. The purchase of artificial manure to restore the fertility of our soil is a very easy way of getting over the difficulty; but is it not very desirable that we should ask ourselves, Have we not some undeveloped sources of manure at home that it would be worth our while to look up and bring out? And would it not well repay us to give this question of succession of crops our best attention? The third head of my subject—The keeping more stock: To keep in view profit, as I before mentioned, we must find one-half of the keep from the green crops of the farm. Will not the having 60 acres of sainfoin increase my food for stock, whether it is cut for hay, cut for soiling during the summer, in the yards, or whether it is feed upon the land for sheep? I have found sainfoin for horses and cattle in the yards during the summer months surpass any other green food; and for chaff during the winter for horses, cattle, and sheep, there is nothing equal to it—it is both food and physic. Will not having the sainfoin from 60 acres of land, all taken off this 60 acres and consumed upon the rest of the farm, enable me to keep more stock; and adding the other half of cake or corn, make the rest of the land grow more corn? Will not the 60 acres of land requiring no manure for the time it is in sainfoin enable you to manure more heavily the other arable lands of the farm? Will not these 20-acre pieces of land that have been treated in this way, when it comes to be laid down with clover, be more kind for a plant, cut more hay, or carry more stock, and therefore grow more wheat? Will not growing beet-root in the way I have mentioned enable us better to cultivate the fallow shift? I have mostly found this portion of the fallow the worst cultivated of any part of the arable land. Will it not also enable us to sow more swedes upon our light lands, increasing the quantity of food for grazing stock? Will not the putting of these things fairly together compensate for the loss of 20 acres of barley? And will not the having these 60 acres in sainfoin of three different ages be the best means of providing against such dry summers as we have been having, and also prove no loss in a season when we have plenty of rain? To arrive at a proper conclusion, I will name what I have had a field of 16 acres of sainfoin produce these last three consecutive years: 1868—first crop of hay, 33 waggon loads; second crop fed by lambs. 1869—first crop of hay, 35 waggon loads; second crop, 80 sacks of seed. 1870—first crop of hay, 33 waggon loads; second crop seed, estimated 56 coombs. And here I may add, I have now the option of taking it up for wheat or letting it lie another year, which I intend to do, in consequence of my young seeds having failed. I shall be following out one of the rules (if not all of them) of a great and successful merchant, who had three rules by which he exercised his judgment and conducted his business, viz., "Take an option wl ever you can. Cut short your losses. Let your pr run on."

GROWING CLOVER.

THERE are some matters connected with the growing of clover that are scarcely sufficiently attended to, and need reiterated notice. In the first place, the importance of having only perfectly good, sound seed, cannot be too strongly impressed on our farmers. In a case like this, where, from the great expense of the seed, the generality of farmers are only too apt and willing to err on the side of economy, by giving as light a seeding as they think can be made to *take*, it is not to be wondered at if many failures arise from a deficiency in the quality of the seed.

Then, again, farmers usually depend on red clover alone, when, if the matter of growing clover were properly understood, it would be found more advantageous to sow a mixture of different sorts, say one-half of red, one-quarter alsike, and the remainder of white.

In sowing the seed, it is of importance that it should be evenly distributed over the land, a thing that can only be done where the operation of sowing is entrusted to a thoroughly reliable and experienced hand. A patch here and there a little thicker than the rest not only looks unsightly, but also makes the crop a very uneven one at haying-time. We often see fields of clover that look as if they had grown in long strips with great gaps between. This is caused by the want of evenness in sowing the seed; the sower having nothing but his eye and memory to guide him, takes too wide a strip at a time, and, in throwing the seed, the bulk of it falls directly in front of him, leaving the edges of the strip he thinks he is covering, with a mere sprinkling of a few scattered seeds.

In sowing clover, the better plan is to have several small poles, with a rag on the end of each, and plant these in a line, one at each end of the field, and one, two, and three in the centre, according to the size of the field, in the same way as is often done to mark the line of the first furrow in commencing a new bout in ploughing. The sower, when he starts, places a pole exactly the distance from the one standing at the head of the field, as he intends to make his cast of seed extend. As he comes up to those in the line, in throwing his cast, he removes them exactly the same distance to the side he is to come back on. In this way there will be some regularity of casting ensured. When the land is divided by plough furrows into spaces just wide enough to be covered at two casts, the furrows may be made the guiding line.

This season will doubtless prove a very trying one on all newly-seeded grass. The early part of the spring was so dry that there could not be a good *catch* of the seed; while the latter portion of the season, since the rains came, has been such as to promote a heavy growth of weeds of every sort to choke out the weak plants of clover. In cases where there has been a partial *take* of the clover, something may yet be done—after the grain harvest—to fill up the vacant spaces. The best way is to take a large garden rake and some seed to the field; sow every vacant space, and cover lightly with the rake. This late-sown seed will form plants strong enough to stand the ensuing winter, provided all stock are kept off, and the plants allowed to grow so as to make a top that will act as a winter mulch to them.

Again, we find most farmers are in the habit of turning their stock into the newly-seeded clover immediately after the grain which covered the land, and acted as a mulch to protect the young plants from the scorching sun of summer, has been cut and removed. This is one of the great causes of failure. The young plants at this time want to have every chance given them to increase in size and cover the ground, so as to act as a mulch to their own roots. It is better to leave such fields entirely shut up from stock until at least the end of September, when, if there is a good growth of strong plants with a heavy top, it will do no harm to feed down with stock to only a moderate extent, that is, just so much as will still leave the plants strong and vigorous to resist the winter frosts. With a very weak, thin growth of plants, it would be better to keep stock out altogether, and try what can be done to increase the grass crop by seeding Timothy on the land in September, giving a light harrowing immediately after sowing the Timothy, and a dressing of superphosphate, which will greatly stimulate the young clover. The young Timothy can stand the winter well, and will commence to tiller out at once after starting, so that, with a favourable autumn season, we should expect the following year's grass crop to be a fair one, so far as covering the ground goes.—*Canada Farmer.*

COMMON SENSE FARMING.

R W. H. WHITE writes as follows to the *Albany Cultivator*:—

ave scientific agriculture, scientific farm- ming as an art, &c., treated ably and at in our agricultural and other journals, y not as well have it in plainer, more n words, common sense farming, except sound of the thing?

ce and art are words too indiscriminately nerally. As I understand the terms ap- to agriculture, science would seem to theory, as, the science of agriculture, of agriculture; the art would be, theory nce, applied in practice. While theory visionary, art must be real; yet we can y have the one without the other, for art rt needs theory first to arrive at it; and mproved upon by theorizing, and apply- t theory according to common sense and judgment.

le little direct practical or absolute know- an be obtained from mere theory, or the g of the theorizing of scientific writers, y are valuable auxiliaries to the advance- f art, and the understanding of the nature omposition of soils, plants, &c., and also me of manures, their proper application to il in order to be the greatest advantage to rticular crop which they are designed to t. Common sense and sound judgment, ith discretion, will learn to determine with cy the adaptation of any theory to parti- circumstances, and in applying the same l experiment on a small scale, will soon ine its practicability.

iculture or farming is governed by fixed ples, just as much as any other branch of ss; and to pursue it advantageously the r must be quick of perception, far seeing, ergetic in action; he should be able to see d from the beginning, accidents excepted, e able to decide questions, and be fully per- d in his own mind after short reflection, ot be unreasonably influenced by every l of doctrine" or opinion expressed by others. hould be able to comprehend "that cir- ances alter cases;" what may be the best e under certain conditions and in certain ties. Common sense, governed by sound judgment, would seem to determine these questions, and also to sift the practical from the impracticable, as applicable to his particular circumstances, in the writings and experience of others communicated through the medium of the press or otherwise.

Perhaps we can arrive at a better understanding, and I can more clearly define my proposition by typifying the management of the common sense farmer. Upon entering into possession of his farm, he makes himself acquainted thoroughly with all its parts, studies its capabilities, and notes wherein it is lacking, and the cause, together with his ideal remedy. Does any portion of it shew that there is an excess of water in the surface soil, he at once decides that this portion needs draining in order to carry off this surplus water; and forthwith he sets about its accomplishment, progressing with it as his circumstances will admit of its accomplishment.

He stocks his farm with such stock as he finds it best adapted to, keeping in mind profit and local circumstances. His stock is judiciously selected, and that which is likely to prove the most profitable of its kind; he correctly judges that the farm is well capable of carrying so much stock, and that amount he does not attempt to exceed; so that, as the season comes round, his stock, instead of barely holding their own, advance in value as well as in condition; he understands that it costs no more to keep good stock, and in good, thriving condition, than it does to keep poor stock in low condition; for, while a fine pair of oxen will readily sell for 300 dols. or more, a different pair will sell for no more than 150 dols. to 200 dols. A smooth likely colt of a year old, out of a blood dam, and sired by a superior horse, will sell for 200 dols. to 300 dols.; one from an inferior dam and scallawag sire will be dear at 50 dols.; and while the one kept till four years old will readily bring 500 dols. or 600 dols., the other will bring no more than 100 dols. to 150 dols.—while the cost of raising the better, after foaling, is but a trifle if any more than the poorer, and while one pays a handsome profit, the other scarcely pays cost. So of all his stock; all he raises is the best, and well cared for while young. His land being well drained, he is enabled to commence ploughing much earlier than his neighbour on undrained land, and he gets his seed in earlier, and in better condition, to bring him a good crop. He ploughs his land in a workmanlike manner, and if it has been ploughed only 6 inches deep heretofore, he ploughs 1 or 2 inches deeper, following with a subsoiler where necessary.

If he has manure only sufficient to manure 5 acres, he does not spread it over 10 acres, considering that there is greater profit in growing the same amount on 5 acres that will be produced on the 10 acres; he husbands all his resources for manure, and studies its economical application. He attempts no more than he can accomplish with what help he can command. He adopts a system of rotation of crops, adapting the crops to the soil and circumstances; understanding the theory, he finds it stands the test of practice. He adopts a system of accounts with his farming operations, and can tell you the cost of production of any product of the farm, and at the close of the year he *knows* whether he has worked his farm at a profit or met with loss. He grows no crop, nor continues the production of any article, that he finds pays no profit, implied or real.

He provides the most approved, best constructed farm implements, of whatever kind he finds indispensable, well understanding that more work can be accomplished with the same power, and that they will last much longer to pay extra costs, &c.; and then he is particular to keep them in thorough repair, and after using them, cleans and puts them in their appropriate place in the tool-house; has "a place for everything, and everything in its place," well knowing that time, which to him is money, is saved in so doing. His fences are always in good repair, and of sufficient height and strength to turn all ordinary stock; his buildings are all in good "apple-pie" order, well painted, in perfect repair, &c.; all conveniences are arranged, not only to perform all necessary work pertaining to out-door, but also for the saving of labour in the house, dairy, and domestic departments. His workmen are instructed beforehand what the work is to be, and what is expected of them the next day, and by endeavouring to get them interested in the forwarding of his work, finds his own profit. He uses them well, conciliating their goodwill, without making himself too familiar. In the general arrangement of his farm operations, he so plans his work that each kind is done just at the right time; if he is to plant, his land is thoroughly prepared, manure, &c., ready, and the seed put in properly in its season without delay, except by unpropitious weather. His grass is cut for hay when it comes into just the right state, and never injuring by overcuring, drying, &c., and stored in good tight barns.

He provides for the contingency of short pastures by sowing fodder crops, to be drawn on when feed begins to grow short in his pastures. He also provides good comfortable stables for all his cattle, and sees that every desirable comfort is enjoyed by them. In short, he has a system of operations, and works by system, knowing that little profit can be derived where order and system are ignored.

At the beginning of winter, his arrangements are ready to meet the season's advance; his well-filled garners shew that his season's labour and toil have been well rewarded, and when the year comes around, he finds his balances tell on the right side of the account.

Amid all his labour, he has not been unmindful of that needed recreation so necessary to the system; he has visited among practical farmers, observing their practices and operations, endeavouring to gain wisdom thereby, and withal, he has not forgotten to provide suitable reading for his own and family's instruction and entertainment during their leisure hours. Neither does he neglect his farmers' club, cattle shows or fairs, but by an attendance thereupon, and contributing his mite, gains, as well as imparts, much practical information.

Herein, in part, I have endeavoured to pourtray a *farmer*. The reader may call him a common sense, practical, or scientific farmer; for my part, I think him one who takes an exalted common sense view of his business.

THE MECHANICS OF AGRICULTURE.

ecent meeting of the Turriff Agricul-
al Association, Mr Leslie, of Burnside,
, who is the inventor of a system of
ughing, read a paper on the state and
of the mechanics of agriculture. He
ed by comparing the cost of physical,
nd natural forces, and the advantages
ter in point of economy, though their
prevented by the complexity and cost
achinery required. Water-power had
been used experimentally for plough-
the time would come, he doubted not,
e greater part of Aberdeenshire would
hed by water-power. There are two
s in which we may look for improve-
implements and machinery used in
re; one by cheapening the machinery
ratus, and the other by increasing
iency of the implements, so that the
ower might be reduced to the lowest
point. He then proceeded to point out
d been attained, and what he believed
ainable in these days in the machines
the operations of the farm. Beginning
plough, he said a young man left the
istrict lately, and went to the south of
to manage a farm. He found the
drawn by five horses in line, and altered
ngement to four horses, in two pairs,
ore the other, saving a horse. The
as described as a primitive-looking im-
Perhaps, by adopting a lighter draught,
ing three horses abreast, another horse
dispensed with. At any rate, the saving
orse out of five was something con-
e, and the neighbours were all going
the new invention. He then noticed
ents at Paris in 1856, at the Highland
show in 1859, and at other places, shew-
Howard's (of Bedford) single plough
per cent. lighter in draught than the
oughs, while oats sown on the ground
d by it produced the heaviest crop both
nd straw. He was present last winter
trials made by Mr Milne, Mains of
, with a common swing plough, How-
-wheel plough, and a three-wheel plough
Mr Reid, Muiresk. The trials shewed
d superiority of the two-wheel plough
swing plough, and of the three-wheel
ver the two-wheel. The use of a wheel
as a substitute for the sole plate of a plough, with a view to the reduction of friction, is not new, neither is the combination of two ploughs into a double-furrow plough, which is several centuries old; but as far as he was aware, the combination of the two, for which we are indebted to Mr Pirie, Kinmundy, is a new and valuable invention. How far this combination may be advantageously carried, it is impossible to say. As long ago as 1855, we find a three-furrow plough, exhibited by Mr Williams, a farmer in Wiltshire, which was found to effect a saving in draught of about one-third. It appears likely that on a light level land, free from stones, the three-furrow plough would have an advantage over the two-furrow plough. Referring to the comparative cheapness of steam over horse power in ploughing, he said the great obstacle was the cost of the apparatus. He had made experiments extending over several years, with a view of reducing the cost, and he believed it was possible to do so to the extent of one-third, in the case of the less expensive apparatus, and of more than half in the case of the more costly. He had also kept in view the possibility of using fixed engines and water as sources of power, which he believed to be quite practicable, and especially in the case of water-power, very advantageous. The time would come, he doubted not, when every foot of fall on the Deveron would be utilized, and a great part of the cultivated land ploughed by water, at a cost not exceeding 3s. 6d. per acre. He referred to the zig-zag iron harrow, and on a neighbour's farm had saved its cost in one year. With reference to sowing-machines, the drill and broadcast were pretty equally matched on well-ploughed lea, but in sowing land after a green crop, the drill manifested the advantage. He recommended a continuation on different soils of the experiments made by Mr Milne, Mains of Laithers, as to the distances between the rows and the qualities ot seed that would produce the best crop, and suggested to the committee to consider whether something might not be done by members co-operating for the purpose. He then entered upon the history of the reaping-machine. In modern times, the first reaping-machines to be continuously worked was invented sixty years ago by Mr Smith of Deanston. It consisted of a wheel 6 feet in

diameter, sharp at the outer edge, which was caused to revolve at considerable speed, and a conical drum, by which the corn was supported till delivered at the side in a continuous swathe. This machine had the advantages of simplicity and positive motion, or the motion continuously in the same direction of all its parts, not possessed by any machine at present in use, and he would not be surprised to see it revived, when farmers had learned to lay their fields flat, and gather off the stones. One of Smith's machines was wrought in the parish of Turriff during the years 1833 to 1837, by Mr Mess, who was at the time tenant of Barnyards of Delgety, but went to America, from which he returned a few years ago, and is still alive. The unevenness of the surface was the principal cause of the failure of that machine. For farms of considerable size, the most convenient reaping machine was that with side delivery in sheaf; where 100 acres of grain have to be cut down, a machine of that kind would repay its cost in a season. Even where crops are laid and twisted, it would, by a little management, and the partial use of the scythe as an auxiliary, make a much better job than could be made by the scythe alone. He might mention that the substitution of the scythe for the hook in reaping, which took place in that quarter about sixty years ago, was said to have originated in the parish of Auchterless. He then referred to the plan adopted by Mr Runciman (and described in the *Journal*) of communicating power from a water-wheel to a mill 130 yards distant. Experiment shewed that 120-horse power could be conveyed 12½ miles with a loss of only one-fourth—opening up a wide field for the utilization of water-power. Referring to machinery for manures, he mentioned that bones were first used as manure in the north of Scotland by the late Mr Rannie, who was at the time tenant of the cottage farm of Cornousie, in the parish of Forglen. Referring to machinery for irrigation, he pointed to a plan lately patented for distributing water in the form of showers by means of a fixed apparatus, which can be paid by a fixed rent charge of 25s. per acre for twenty-five years, and, where steam is required, will cost about 3s. per acre to work. In occasional seasons like the present, there was difficulty in getting a plant of turnips on account of the dryness. Chandler's liquid manure drill machine, which he had exhibited in the show, was intended to meet the contingency, by enabling the farmer to apply with the seed a quantity of water sufficient to enable it to vegetate. This machine had been in use for fifteen years, and experiments had shewn that the crop produced by the manure (in that case superphosphate of lime) dissolved in water, and applied by the machine, had been greater than that produced by the manure in a dry state, in the proportion of one-fourth to one-half more, the cost being not more than 1s. per acre. He concluded his survey by quoting the remark of Mr Edwin Chadwick, that the number of improved agricultural implements and machines that might be profitably used, and are not, is greater than the number of those that are used; and he made a strong appeal to the proprietors, who profited most by the introduction of improved machinery, to co-operate with the farmers.

Papers by Tim Bunker.

NO. LV.—TIM BUNKER ON OLD STYLE HOUSE-KEEPING.

IT was a rainy morning in August; I had five tons of hay down, and it was "morally certain," as Mr Spooner says, when he is putting a thing strong, that I shouldn't have any hay weather, so there was nothing to do but sit in the house and see things grow. There is a great satisfaction in that, and blessed is that man who has his fields and meadows where he can see them from his window! I have seen some rather handsome pictures down in the Academy, and other places, but there are none to compare with the view from my dining-room window. There is a pasture dotted with cattle and sheep, beating anything I ever saw on canvas. It does not cost half so much to build a house with the picture gallery outside as it does to have it within, and then you are never pinched for room, and it costs nothing to have your pictures re-touched, and the frames re-gilded. It is a source of endless entertainment and instruction to study this out-door picture gallery, and rainy days give us the leisure, and a new light to see them in.

Mrs Bunker had got her cheese in the press, and the milk things washed up, and things put to rights generally, when I saw her overhauling a bundle of old yellow papers that looked as if they were a hundred years old. One of them was an old account-book of her grandfather's, made by doubling a sheet of foolscap twice, and sewing it together. The thread is stout linen, such as her grandmother used to spin on the linen wheel.

"Now," says she, "Timothy, I like to look over these things, and see how differently folks live now from what they used to when my mother was a girl. Here is the account of my mother's 'setting out in life' when she was married, in the handwriting of my grandfather, Amos Dogett."

"When was that?" I asked.

She read from the manuscript: "Our eldest daughter Sally was married to John Walton Jan. ye 29th, 1784."

"Things that I let my daughter have was one horse, 10 pound; one new side-saddle and bridle, 5 pound." "Horse-flesh was pretty cheap then," I remarked; "only about one-quarter of the price of good sound horses in Hookertown to-day. Side-saddles have not fallen off much. They were a good deal in demand then, and not much now. You see Mrs John Walton, bride, had no other way to get to her new home but on horseback, and all other brides, and damsels in general, had either to try the saddle or go on foot. Happy was that damsel who could boast of a horse on her wedding day!"

Immediately following the saddle was the entry of "one pot, 8 shillings; one small iron kettle, 6 shillings; one iron spider, 4 shillings; one pair of flats." It would seem from this that Mrs Walton was expected to cook her husband's dinner, and to iron the clothes. Mrs Bunker says she was a capital cook and laundress. I think it must run in the blood. I have no doubt I am indebted to that pot and spider for all the good dinners I have eaten under my own roof.

Then follows, in the bridal outfit, "two candlesticks, two shillings." These must have been iron, such as went out of date about the time I was a boy. The bottoms of the dilapidated sticks used to figure on butchering day in scraping off the hair from pigs, and nothing better has been invented since. Then follows "one case of knives, one fire shovel, one large iron kettle, one tea-pot, one tea-kettle, one trammel." Then, for personal adornment, the bride had "one gauze handkerchief, 3 shillings sixpence; one pair of gloves, same price; one pair of shoes, 6 shillings; one pound of whalebone and four and a-half yard moreen for a skirt," which shews what the whalebone was intended for. Our grandmothers probably split their own whalebone, and never dreamed of steel hoop skirts.

The fitting out of the bridal chamber was "one feather bed, 4 pound 10 shillings; two under beds, 1 pound 1 shilling; four pairs of sheets, two coverlids, two fulled blankets, one chest and lock, and one looking-glass, and one paper of pins."

The table furniture was rather meagre—one set of tea-cups, nine plates, four platters, half-a-dozen spoons, half-a-dozen tea-spoons, two basins, two porringers.

A significant entry was "one little wheel, one pound." This was the linen wheel on which all the sewing thread was spun, and the fine linen for shirts and sheets, and other articles for the bed and for the person. There was also "one set of loom irons, 3 shillings." John was expected to make the loom himself. Fortunately, it consisted mainly of wood, and the framing was not difficult. This brings back the good old days of homespun. In that loom was woven all the clothing, woollen and linen, of herself, husband, and children, for a whole generation. What visions of solid work and happiness the loom and wheel open to us!

We find also among the bridal items "hard money for to buy a cow with, 5 pounds 8 shillings." The price of cows was relatively much higher than the price of horses. Twice the sum would now buy a very good cow. That cow laid the foundation of John Walton's fortune. His wife understood the mysteries of the dairy, and the one cow grew, in a few years, into a herd of thirty, and the Walton butter and cheese became famous.

The whole outfit foots up £44, 19s. 6d. That stocked a housekeeper in 1784, and probably she was better off than most of her neighbours. The whole would not equal the cost of the piano now in many a farmer's parlour.

"The tea-set that Deacon Smith gave Eliza at her wedding cost £40," added Mrs Bunker.

"I know it; and the rest of the presents were worth £200, to say nothing of the furnished house into which she entered when she got back from the bridal trip."

"A single looking-glass costing 8s., and a mirror covering half the side of a parlour, and costing £60, is another contrast worth looking at," said Sally.

"And the young brides that prink before them are no handsomer or smarter than Sally Walton's daughter forty years ago. It is time you forgot that, Timothy. It is a long while ago."

Here the dinner bell rang, and the dingy account-book was returned to its place in the bundle.—Yours to command,

TIMOTHY BUNKER, ESQ.

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NO. LVII.—TIM BUNKER ON NEW NOTIONS—VISIT TO TITUS OAKS, ESQ.

Since my last writing, I have been to visit Uncle Di Tubbs. This is a great country, uncle, I said to him one day. You ought to have some smart farmers round here that go in for fancy stock.

"Just so. We have lots of them, men who got rich in the city, and come out here and spend their money and call it high farming. I'll bet you a sovereign every potato they raise costs them five shillings."

"How do you make that out?"

"Well, you see, they take particular pains to buy the roughest, stoniest place they can find, and next see how much money they can bury up in it. They blow rocks, tear down hills, drain swamps, fill up ponds that are, and dig ponds that ain't, and call them lakes; cut down trees that are standing, and plant trees where there are none; put the surface soil down to the bottom, and bring up the yellow earth for the sake of making it black, and play mischief generally with the land before they plant it. Here is Squire Oaks, just above me, who has been ripping and tearing with his land for a dozen years and more, and I believe every acre he's got cost him £40, if not more, and I can beat him with all his manure and subsoiling."

, now, suppose we go over and see
aks' place this morning. I want to
mething to carry back to Hooker-

t do you say, Esther? inquired Uncle
ng up to headquarters.

ink," says Mrs Tubbs, "that Sally
ke to see one of our country seats.
s has a fine conservatory, and the
re very attractive this winter." So it
ıged that we should visit the country
itus Oaks, Esq., in full force.

cted to find a man, city bred, with
ı, and stove-pipe hat, and gold-headed
dering men round right and left.
of that, I found a man that might
n taken for a native of Hookertown,
ng away at the dirt and stone as if
't afraid of them.

, Squire," said I, "what have you
ew us? Any new notions around?"

ed an experiment on

CURING CLOVER HAY,

uld like to shew you the result."

ok us out to the barn and shewed us
erhaps 12 by 30 feet, from which
eeding his Alderney herd. It was
d with as handsome clover as I ever
I was not afraid of having my word
I should say the handsomest. It
lown in the middle with a hay knife,
could see just how it was managed.
as about 10 inches of clover, and
ut 2 inches of salt hay, in alternate
The clover had all the leaves on,
nd was as bright and green as on the
as put in the barn. To shew that
as as good as it looked, Squire Oaks
ıt a lock of it, and also a handful of
from the opposite mow, and pre-
oth to an old cow. She smelled of
ıthy first, and then opened her mouth
clover, without stopping to take a
sniff. The same was done to an
heifer, who might not be supposed
well versed in hay lore, with a like
here was no mistake. It was tip-top

," says I, "Squire, how did you cure it? For this will do to tell in Hookertown."

"It is the easiest thing in the world," says he. "I cut the clover with a mower, when it was just in blossom, and let it lie in the sun till wilted. I then put it in cocks, and let it stand until the next day, when I put it into the barn. There was first a layer of salt hay rather thin, then a thick layer of clover. It comes out just as you see it. I think one ton of that clover is worth two of hay, as it is usually cured. All the leaves and all the juices are there. The salt hay, somehow, helps cure it. I do not attempt to explain the philosophy of it."

Farmers who have old stacks of this hay, and heaps of refuse straw about the barn, should save them, and try Squire Oaks' experiment. I guess there is more virtue in the dry hay than in the salt. It helps the ventilation, and makes the curing complete.

A New Mulch for Strawberries was shewn us in the garden. This consisted of sods from a brake swamp, cut an inch or two thick, with a spade, so that they could be laid between the rows. He had been draining a piece of wet land, and had plenty of these on hand. When fresh cut, they are free from seeds of weeds, and so sour that nothing will grow them the first season. They are easily handled, keep the ground moist and the berries clean. After a year's exposure, they may be spaded in, or removed to the manure heap.

Trellis for Grapes.—Mr Oaks has turned his ledges to good account in training grape vines all over them, by means of wires. These ledges, some of them, present a bare surface of 20 or 30 feet, and as he could not very well remove them, he covers them with a mantle of green in summer, and has the purple clusters in autumn. This is a timely hint for the multitude of improvers in Westchester county and elsewhere, who are troubled with ledges. They were made on purpose for grapes.

How Nature Plants a Tree.—He shewed us an apple tree planted on Nature's plan—*i.e.*, as near to the surface as you can get it—and a *spot* where a tree was planted on some gardener's plan burying the roots in a deep hole. The latter spot was vacant, while the tree was flourishing, and had made a very broad collar just above the surface of the soil. Titus Oaks, Esq., laid very great stress upon this mode of planting. "Nature," says he, "in growing an apple tree, first runs the seed through a cow's stomach, and deposits it, in a thick vegetable paste, upon the surface of the earth or a little above it. The following spring the seed sprouts and the roots find their way into the earth. Such trees make the hardiest stocks, and are the longest lived."

An Orchard upon a Gravel Bed.—This he regarded as one of the triumphs of his art. There was no mistake about the poverty of the soil, for it was made up of sand and gravel, as the adjoining bank shewed. No one had ever got a crop from it before. There was just as little mistake about the apple trees. They were very thrifty, well-grown trees, and fruitful. The gravel bed had been treated with muck from an adjoining pond. That was the secret.

We left, highly pleased with Titus Oaks, Esq., and his notions. He made us promise that we would not mention his name in connexion with his improvements, a promise which we keep by taking his light out from under his bushel, and putting it upon your candlestick.—Yours to command,

Timothy Bunker, Esq.

The Garden.

PITCHER PLANTS.*

E plants are amongst the most ious of Nature's productions which introduced to our gardens. They popularly as “ Pitcher Plants,” from us ascidia or pitcher-like bodies ninate the midrib of their leaves.

ting of pitcher plants, I shall con- lf exclusively to the genus Nepen- ugh the genera Sarracenia, Darling- l Cephalotus would be found equally of attention.

enthes we have now a considerable in cultivation. Some are hybrid ich have been produced in this but the majority are introduced nd, what is very singular, we appear troduced the least interesting kinds re are many large and most remark- s yet to introduce, which will be uisitions for our plant stoves. The hose in cultivation are :—Nepenthes a, N. ampullacea picta, N. distilla- distillatoria rubra, N. Dominiana, s, N. gracilis major, N. hybrida, N. naculata, N. Hookeriana, N. lævis, mphora, N. Rafflesiana, N. san- d N. villosa.

f these are hybrids which have been in the establishment of Messrs Sons; but beautiful as many of they are entirely eclipsed by some unintroduced, such as Nepenthes Rajah, N. Edwardsiana, N. Boschi- ome others, which I am extremely see in cultivation.

absurd stories are in circulation the uses of the curious ascidia at the extremities of the leaves of nts. The most popular amongst these, describe how the plants are endowed with such extraordinary vitality as to enable them to grow in arid sandy deserts, where nothing else in the shape of vegetation exists; that they have the power of distilling water to fill their pitchers; that the lids are closed down to prevent evaporation; and that birds, animals, and even man is accustomed to resort to them to allay their thirst with the cool and pure water found therein. It is scarcely requisite for me to state that these are nothing but pretty fancies, the fact being, that they grow in boggy swampy soils, and cannot exist long in an arid atmosphere.

In Nepenthes Hookeriana and N. Rafflesiana, an extraordinary alteration in the form of the pitcher takes place as the plants attain height. Thus, the leaves which are near the base, are broadly winged in front, with ciliated hairs at the edges, and the long petiole is attached in front, and passes up between the wings. But in the pitchers produced higher up the stem, a wonderful alteration takes place: the petiole is attached behind, the pitcher becomes narrow at the base, and the wings entirely disappear. To the cause of this alteration of form I have utterly failed to obtain the slightest clue, and I should be extremely glad to hear the opinion of any who may have given some attention to the subject.

The species of Nepenthes appear to be entirely confined to the Old World, and chiefly find their homes in the islands of the Indian Archipelago, where they grow in boggy soil, at considerable elevations—indeed, in some instances, up to 9000 feet—the mountain of Kina Balou, in Borneo, appearing to be their head-quarters. Two species (N. cristata and N. madagascariensis) are found in Madagascar; the Philippine

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the Horticultural Congress at Oxford, July

Islands also produce one or two species, which, however, are not peculiar to them, and one species (N. gymnophora), which grows plentifully in Java and several other islands, is also found in New Caledonia. Another species (N. Phyllamphora) is said to grow on the Khasia Hills at an elevation of some 3000 feet, and this is probably the extreme northern limit of the genus.

Few people have had the pleasure of raising Nepenthes from seeds, and this brings me to my principal object in writing these remarks; for as there are a quantity of fine species yet to be introduced, a few of which I have already named, and as it is not generally known that the seeds of these plants do not long retain their vitality, I wish to impress upon the minds of any and all, who are either about to proceed to the countries they inhabit, or who may have friends resident there, the absolute necessity there is that seeds should be sent home by post as soon as gathered; and I wish our home cultivators to remember that these seeds should be sown immediately upon arrival, irrespective of the season. It has been my good fortune, during the course of my gardening experience, to raise young plants of N. distillatoria both from home-grown and imported seeds, and I may safely say the pleasurable feelings created in watching their curious leaves unfold, far surpassed that derived from the growth of any other seedlings, but, at the same time, the doubts, hopes, and fears for their welfare were equally increased.

Under the impression that an account of my system of raising these seeds may be of service to some, I shall offer a few remarks on that subject.

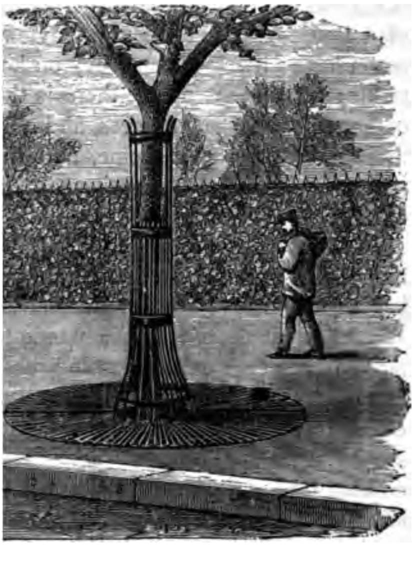
The seeds having been obtained, take a well-drained seed pan or pans, and fill up to within an inch or two of the top with a mixture of peat and sphagnum moss, in equal parts, adding a little silver sand to keep it sweet. Upon this the seeds should be sprinkled, and not covered with soil. This may seem wrong to those obtaining the seeds for the first time, because they will appear to be large, but, if examined, they will be found to be in reality very small, and enclosed in a long loose tunic-like covering, which is evidently a provision of Nature to flo minute seed to a safe position for its ge tion. This loose coat also serves to p the roots during the early stage of exis for it is some time after germination roots are protruded from the tunic. seeds having been sown, the pan mu either covered with a bell-glass, and pl into a bottom-heat of about 80 deg. deg., or, what is better, the seed-pans s be placed in a small close frame, whe heat can be maintained. In this tempe they should begin to germinate in the of a month or five weeks; and it is curious to observe that the very firs which is formed after the seed leaf, is little pitcher—not like those you see the full-grown plants, but very much bling miniature leaves of the Sarr purpurea. These are produced freel quickly, and the plant soon resembles ball, with its numerous almost sessile As soon as the roots begin to sprea seedlings should be transplanted singl very small pots, but still kept in the they begin to assume their normal form

These plants will succeed either in p in baskets. I prefer the latter, becaus display their beauties to greater adva but whether grown in pots, baskets, or or planted out in a prepared border, i be borne in mind that they require mo face than depth, and that the soil mu open to allow their black woolly-lookin to spread. Frequent applications of over the foliage, through the agency syringe, will be necessary during th and a liberal supply to the roots will be advantageous. These rules being att to, and the plants shaded from the sun to a greater extent than is usually Nepenthes will not be found difficult t vate, whilst their unique and peculiar be a never-failing source of wonder and as ment.

I sincerely hope to see the speci already have, cultivated to a far extent than has hitherto been the cas the fine species from Borneo and t rounding islands speedily introduced gardens.—*B. S. Williams, Victoria N*

IVY.

IE of the best general service plants for
all gardens, and for small gardens par-
y, is the Ivy. It is alike at home in
ıe and in shade, to decorate the
-down walls of old castellated mansions
clesiastical edifices, as well as to form
; of evergreen beauty, and edgings of
.t would cope with the finest designs
ıe, and in tile, and in metal. Only
a skeleton to scramble upon—for it
ıges almost any rival—and the clothing
: will not only be beautiful and grace-
l verdant, but of a permanent charac-
Who that has seen the ivy-mantled
of old ruins, with a profusion of
r en deshabille, but was enraptured at
:gance of the spacious folds, and the
eaves of the "rare old plant" of Hiber-
ıme? It is a kingly plant, which not
ır clematises, our loniceras, our aristo-



g. 1—Ivy trained to cover Open Railings.

, our ampelopses, our wisterias, or
mines with their comely inflorescence,
ıt out of court. All these climbers we
amed are excellent things, very excel-
ıdeed, and deserve a place wherever
there is a place suitable for them; but for real general service work, for a dark dingy corner, where nothing but cotoneaster would live, there the Irish ivy will accommodate itself and grow. Talk of the beauties of the gardens of King Rene, nearly five centuries ago, and discourse upon all that has been achieved in the way of representing Nature, in a transplanted state, since that time up till now; and if you leave out this representative of the climbing race in search for something less common, in your ideal of charming the fancy and elevating the taste, and—"And what?"—you will be laughed and jeered at as one who has failed to make a proper use of one of the most useful climbers in Nature.

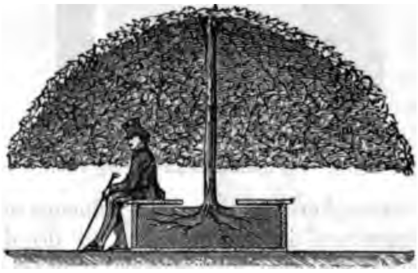


Fig. 2.—Ivy trained as an Arbour.

But while we speak of its usefulness as a drapery plant, for walls so high that few plants known in cultivation could reach; and while we see it in our glades and glens, springing like a wildling from the earth, embracing the growing trees, and many times overtopping such as have had a severe struggle for existence, and been foiled in the attempt, we only shew its capacity for decorating other places where subdued light is only to be had. But the lessons exposed for the observer to note, if he would only reflect, con over, and inwardly digest, are so obvious, so clear, when put before his notice, that the wonder must be to all concerned, why they have not been looked into and applied. If a plant can climb a tall tree, or mount up to the top of the wall of any of our historical ruins, surely it can be made to climb a less tree, or a less high wall. If it can grow with a certain luxuriance, amounting almost to high health, under shade, where neither sun nor atmosphere has the same influence upon its garniture, it can be taken to do duty possibly in these little artificial grottoes, or even indoors itself. But the English public, with the directors of taste as their representatives, have failed to make the most of this sort of thing; and then if we were to tell that body of gentlemen that they manage to do these sort of things in France or America, and speak of the great fund of pleasure that is being created by the adoption of ivy for decorations in-doors, we might be rewarded with the cool look of indifference, and a dry reply. Those who are bold enough to exclaim against time-honoured customs, readily meet with opposition, and that, too, from the quarter not unlikely to be benefited. Mr Repton, in the heyday of his success, bitterly complained of "the opposition of stewards, the presumption or ignorance of gardeners, and the jealousy of architects and builders,"* and the same kind of jealousy or prejudice is apparent in these latter times. But these are only little discharges that cannot interfere with the progress of the age; and so we have hopes that our villa gardeners, whether they be ladies or gentlemen, will, in their own interests, take to the culture and training of Ivy for a variety of purposes besides covering walls or trees.

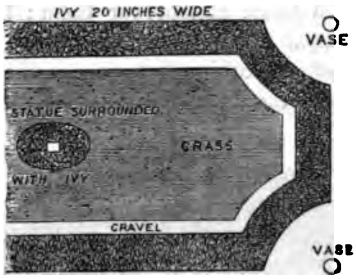


Fig. 3.—Ivy trained as an Edging Plant.

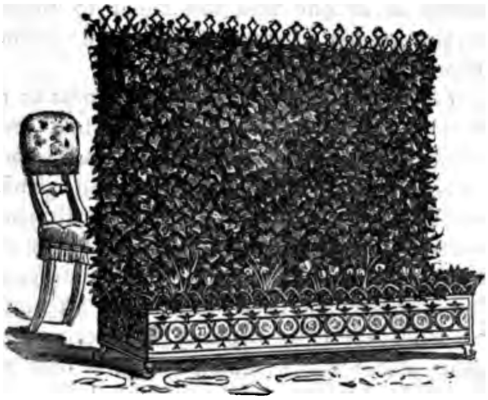


Fig. 4.—Ivy trained as a Screen for a Drawing-room.

As a cheap and effective screen for covering open railings it cannot be matched (see fig. 1). It matters not whether these railings be of cast-iron or of wood, give the ivy time and it will cover them effectually. Iron is too expensive to be blinded up with the leaves and shoots of this climber, but the dwarf wall into which these balusters are fixed can be covered, and is often covered, with a variety of ivies. Where the extent is less limited than about city and suburban residences, these open screens are justifiable; but in small holdings they afford no protection to the inmates, and are far more pleasing to the passer by than to the owner or occupier of a house exposed openly to view. Far better have a living screen of ivy on a wooden trellis; for by that means there is the sense of security from vulgar eyes, and a house is meant always to be a home, and the more pretentious it is the more privacy ought to be obtainable and secured.

But ivy, while it forms a capital boundary line resting upon a wooden or a stone wall, is a most effective garden decorative plant. We have rated soundly the wrong taste of modern flower garden planting in squatty formal masses. Unbroken, they are little else than deserts of colour, and the more we see of them the more intolerable they become. Call in, however, some of the various forms of ivy, train then in pyramid form upon a simple improvised pyramid, or encourage it to grow as an individual, to screen you from the fierce glare of the sun, as at fig. 2, and you have something like design in even modern flower gardening. Break the formal lines of parterre flower-gardening with such species and varieties as the spotted

Irish ivy (Hedera Helix maculata), the gold-en-leaved form (H. H. foliis argenteis), the broad-leaved variety (H. H. latifolia), the dwarf-marbled (H. H. marmorata minor), the arrow-leaved (H. H. sagittæfolia), the digitate variety (H. H. digitata), and many other forms of the pure Irish species. As capital companions, introduce Hedera Rœgneriana, H. Algeriensis, H. canariensis, for they are distinct and beautiful species. All these and many others, which are purely selected sorts, some from batches of seedlings, some from sports which often occur in Nature, are all suitable for the kind of decoration recommended in the flower garden. Associate these with corresponding centres of Virgin's Bower (Clematis) and of Honeysuckle (Lonicera), and with other plants, all gardens would be much enhanced in pictorial effect.

Not only to clothe tiny pyramids are sorts of ivies in their climbing capacity fitted as flower garden plants, but as edging plants (see fig. 3), kept trim, they have a perennial beauty. From the deepest shade of green in winter to the softer yellowish hue that pervades the young leaves, the interest is undiminished. Then the gold and silver variegation and the deeply lobed leaves of varieties, variable in colour, variable in outline, invest "the rare old plant" with additional charms. Many incline to have beds on lawns representing baskets, and where lofty trees predominate, such kind of design is not only permissible, but is in good taste. Well, then, for forming the outline of the basket and covering the handle, by all means select ivy for the purpose. If there be a fair show of blossom or of colour in the interior, the garden basket is a capital sample, shewing Nature dressed but not disfigured by art. All these basket designs to be effective ought to be raised, in other words, have a base of some thickness to spring from. That is quite readily accomplished by inserting stakes, say of 3 feet length crossed in diagonal form. The inner portion is filled up with soil of any good texture, and finished so as to present an easy convex surface. The ivy plants should be prepared, say two or three years old, from cuttings, and if grown in pots after the style of doing these things in the very extensive nurseries of the Bois de Boulogne, they can be planted at once under the turf of the lawn, and trained in one direction round these diagonal stakes. Such a basket prepared in autumn after summer flowers have come and gone, is pretty well clothed in the course of the following season, and, once clothed, if kept trim with the knife, always clothed. In point of economy, therefore, to sink beauty altogether, such a plant used up in such a style is cheap to procure and multiply, and is as effective as it is invaluable.

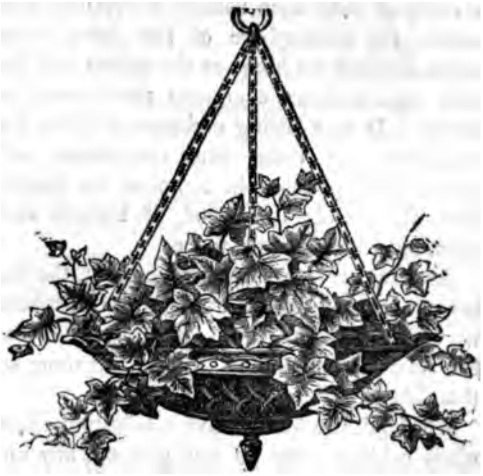


Fig. 5.—Ivy for Hanging Baskets.

As to position there seems no one bad enough for it. On aspects east, west, north, and south, the most of the varieties named above do equally well. In the sunny south and on the Continent, the scorching rays of a meridian sun tell against the foliage in the sunny side of a north wall; but in cities where squares, and verandahs, and porticoes, and windows are all more or less shaded with the piles of architecture about and around them, there is nothing much to fear on that score. The golden edged and the variegated forms, as might be expected, are fully as decided in tone of colouring from exposure to the sun, and if there be any selection desiderated, this must be kept in view.

As an in-door plant, where only the subdued light and the confined air is at any one's disposal, it does most admirable serv

We have really so little of this in England that we are extremely desirous to press upon our constituents, in their own interest, the desirability of introducing it. In France, and particularly about Paris, where the latest fashion reigns, it is made to do the duty of appearing as a living screen in a drawing-room, see fig. 4. Planted in boxes and trained to a wire trellis inserted in the box, it really is more than usually interesting, and makes the atmosphere of the living room quite as much its home as the grotto and the dell, clad with an evergreen mantle out of doors. It is a fitting companion plant for hyacinths and tulips and succulents, and adorns any position in a house, no matter how elaborately decorated, if trained and attended to as it ought to be.

As a conservatory decorative plant, the ivy is most graceful, and the cooler the atmosphere the more beautiful it will grow, and conceal the basket by its living drapery, far more so than is represented by fig. 5.

Although the leaves have a balsamic odour when rubbed, they do not give out any unpleasant smell if let alone. Many object to the odour, and consequently are deterred from introducing them as in-door plants in living rooms. A little further acquaintance with the plants as silent companions will disabuse ladies of this idea. The medicinal properties of the plant are various. The leaves are used effectively for cutaneous eruptions. By tapping the trunks of aged plants, ivy gum is obtained, and is prescribed as a stimulant. The berries are very pungent, much more so than those of the mountain ash. Both fruits are largely eaten by blackbirds and thrushes, who will clear trees of them in a very short time. There is nothing poisonous about them, only, if taken largely by children, they are highly purgative. When the plants have reached a considerable stature, and when the knife or the pruning hook has not been applied, flowers are produced and berries appear. If the hand of man interferes in keeping the plants trim and neat, the reproductive parts, seldom if ever make an appearance. It is only the plants on old ruins, and on such walls as are left entirely to Nature, that yield a full crop of fruit. But flowers and fruit are of no consideration to those who cultivate the plants for their decorative value.

We must not omit to say that, for the charming illustrations to this paper, we are indebted to Mr Robinson's work on Parisian gardening, which has been already noticed in this journal.

Prosper the ivy, we say, for if it is not a rare, it is certainly a beautiful old plant!

ECONOMICAL WALK EDGINGS.

NO. II.—THE WHORTLE BERRY—VACCINIUM VITIS IDÆA.

ROM the resemblance that this pretty little evergreen bears to our most popu- dging plant, some early authors named accinia rubra buxifolia, or the box- d-leaved red-fruited wort, whort, or rtle. Its present scientific name was en by Linnæus, from what is now deemed ave been an incorrect supposition, that it the "Vitis Idæa," or Mount Ida vine of n authors; and its fruit is now known by names of whortle or whortleberries, red s, and cowberries. While in commerce are frequently, although wrongly, named berries. The extreme hardiness of the rtleberry, and its consequent suitability rowing in the coldest and most inclement sures, is evinced by its natural range of tat, which, in the mountains of Britain, nds much above the upper limits of the e heather, while in both Europe and it extends considerably north of the ic Circle.

he whortle bushes are usually under 6 es in height, with creeping roots and some- decumbent or drooping pointed shoots, y of which are terminated either by dense lent racemes, of lovely whitish and pink of the Valley like flowers, or by the ely less lovely clusters of bright red es. When the soil is of medium or gish texture, a small trench should be y cut, of 9 to 12 inches in depth, by 6 es, or such other width as may be desired, he edging or walk-margin; then lay the ts along the walk side of the trench, and with light mould, having a considerable on of moorish or heath peat in its com- ion. This light soil will form an agree- medium for the creeping roots to spread that they will set up a thick growth of g shoots; while the harder surrounding d will prevent them extending beyond their prescribed limits; but when the garden soil is light and somewhat peaty, lining the trench-edges with slates or flat tiles will save much after-trouble in keeping the plants within due bounds. It is also advisable to mix the trench-soil freely with pieces of stone, which not only assist in retaining moisture for the roots in dry seasons, but prevent the edging from being underrun by moles, which are well known to have a predilection for burrowing where the soil is most easily penetrated. An edging thus made will grow freely either in sunny or shaded situations, and may be clipped or trimmed almost as formally as one of boxwood, although such treatment will materially limit the production of flowers and fruit. Few, however, will be inclined to indulge in it, after seeing the more natural neatness of the whortle, either in its leafy greenness alone, or when richly garnished with either blossom or berries; aided, it may be, with such occasional slight trimming as the pinching in of overgrowing shoots, or the clearing away of any out-running suckers. Where margin belts, instead of mere edgings, are to be formed, say of 15 to 30 inches in width, the whortle bushes will appear to still greater advantage, and even more than proportionately large crops of the berries may be gathered. With these, however, it will be necessary to line or edge both sides of the trench with plants, besides planting one or more lines between those outer ones.

As to the uses of whortleberries, their principal application is evident to all who are aware that most of the so-called cranberries which are sold in Britain, and more especially those that are gathered in the Scottish Highlands, as well as those imported from the Baltic, are really not cranberries, but veritable whortleberries; and, in addition to their well-known uses for eating in a raw state, and for making tarts, pies, jam, &c., their juice, boiled in sugar, forms an excellent acid for eating with roast meat of all kinds, and it is also highly recommended for curing colds, sore throats, irritation of the mouth, &c. In Siberia, they are fermented along with barley or rye, and a spirit distilled from them; or with honey, and a wine is produced. In Russia, sweetmeats are also made of them with honey or sugar. In Britain, the juice was formerly in high repute as a dye or colouring matter among country people, making, according to Gerarde's "History of Plants," "the fairest carnation colour in the world." The berries are usually gathered for sale before they have acquired their proper blood-red colour, or attained to that size and juiciness which they do when fully ripe; hence, they are deemed by many to be too sour, bitter, and austere to be eaten unless cooked; but when perfectly matured, many a sportsman and upland wanderer can testify to their agreeable and refreshing qualities.

In habit of growth and comparative size, as well as width of foliage, the whortleberry plants present considerable diversity; but the following are the only distinct forms under cultivation :—

1. The American, or, as it is sometimes named in nurseries, the Siberian whortleberry, from being prevalent in North-Western Asia, as well as in North America, is distinguished by being decidedly larger in all its parts than that of Europe.

2. The box-leaved whortleberry, a native of Virginia and other central United States, is much smaller and more compact in its growth than the ordinary European form, from which most botanists separate it into a different species, under the name of V. buxifolium, in consequence of the flower clusters being axillary instead of terminal.

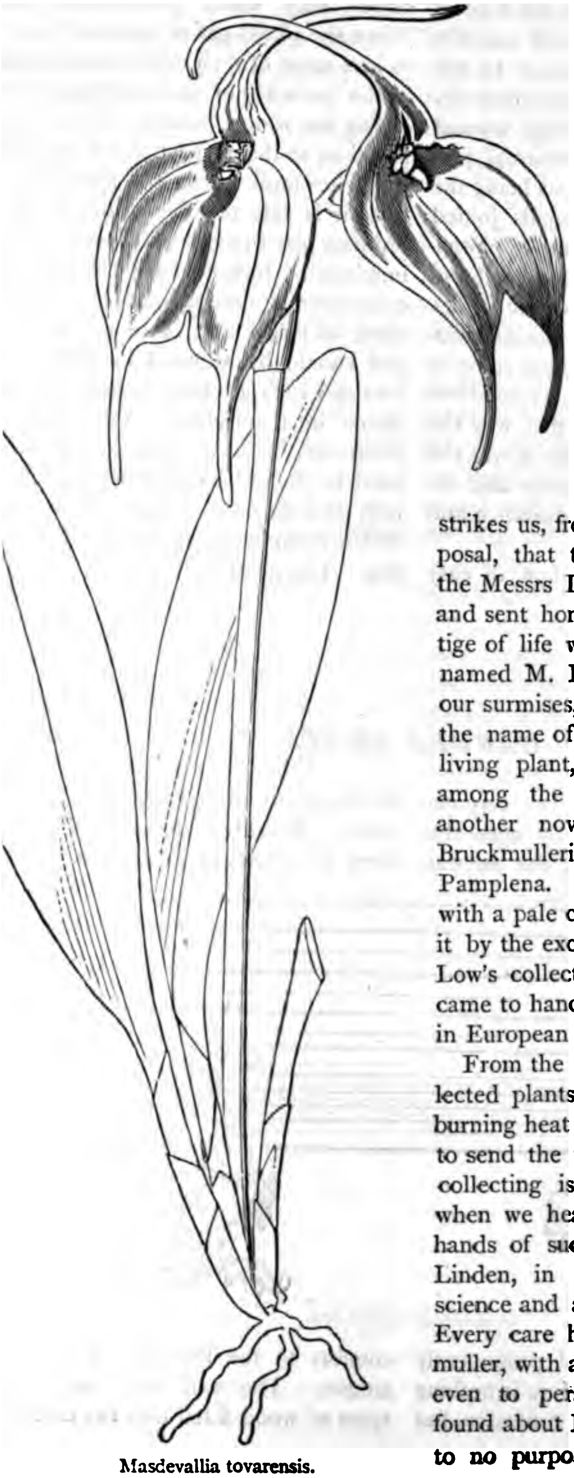
3. The variegated-leaved whortleberry is an old and much-prized plant in Alpine collections, which has recently been introduced as a novelty under high auspices, in consequence of the prevailing rage for variegated foliage. It would form an excellent edging plant, could it be got in sufficient quantities; but it has to be constantly watched to prevent its putting up green-leaved shoots, and it is comparatively worthless for fruit-bearing.

4. The white-fruited whortleberry is an albino, which is occasionally found in Britain. At Torneo, and other northernmost inhabited places in Europe, where red and white currants can only be grown on walls under a winter protection of fir branches, this is the principal garden fruit, and its berries are esteemed as more delicate in flavour than those of the wild plants which there abound.—*William Gorrie, Edinburgh.*

NEW AND RARE PLANTS.

MASDEVALIA TOVARENSIS.

THERE has been quite a furore about the collecting of Masdevallias. First among the batch came M. infracta, and its singular inflorescence commanded much admiration and a considerable sale. Then a near ally followed, but in such limited quantities that it cost some gold to secure it. We refer to M. ochracea. Both of these are very good species, the one has shaded purple sepals, and the other ochre coloured ones. But the genus has numerous representatives in the South American provinces, and we were very much delighted when M. tovarensis made its appearance in Europe. But that charming variety was not to form the last great surprise to European collectors, for we have had, besides, a crimson scarlet form in M. coccinea. Later still we were all captivated with the crimson and violet-shaded tchiana, which for size and brilliancy o rival. We are speaking, of course, of the novelties as they cropped up before us up to and including the year 1869. But, surprise of surprises, to hear of a more striking novelty still! This is at present in the hands of Linden, of Brussels, and is, we understand, in such limited quantity as to fix its value at ten times its weight in gold. But what does that signify when we have a flower the size of M. Veitchiana and of the colour of Pleroma elegans! What a charming addition that must be, of deep violet purple, a colour so rare in flowers in general, and not represented at all in a single member of the orchid family. By the way, it strikes us, from the information at our disposal, that the same variety was found by the Messrs Low's collector, Mr Bruckmuller, and sent home in hundreds, with not a vestige of life when unpacked. It was to be named M. Lowii, but if we are correct in our surmises, it must now, and for ever, bear the name of the fortunate possessor of the living plant, Mr Linden, and be ranked among the family as M. Lindeni. Yet another novelty crops up in 1870—M. Bruckmulleri—found by that collector about Pamplena. It is a spotted-sepalled species, with a pale cream ground, as we distinguish it by the excellent sketching of the Messrs Low's collector. A few of that species has came to hand in life, and will be perpetuated in European collections.


Masdevallia tovarensis.

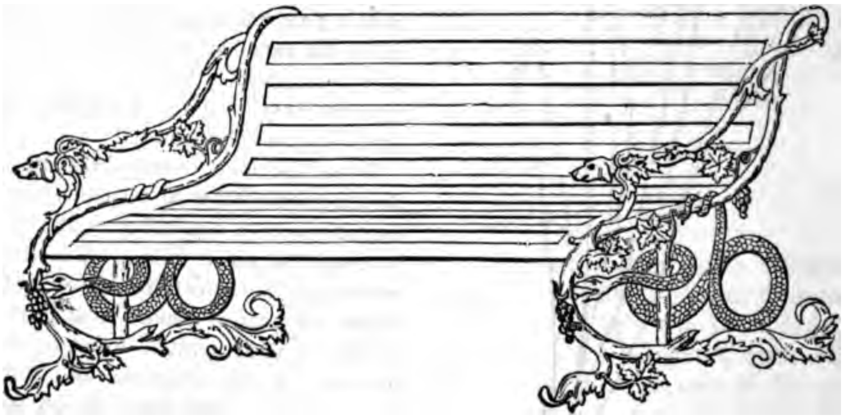
From the long overland distance the collected plants have to be carried under the burning heat of tropical suns, it is a venture to send the plants home. The expense of collecting is something considerable, and when we hear of almost total losses in the hands of such spirited firms as Low and Linden, in the interests of horticultural science and art, we have reason to lament. Every care had been taken by Mr Bruckmuller, with a cargo of these valuable orchids, even to personal attention, from the spot found about Parana to Santa Martha, all to no purpose. It is a pity that highly beautiful species should be all but lost to the country.

Referring more particularly to the subject of our engraving, we have to remark that the pure white flowers, as they appear to the general observer, have a marked delicacy about them which the engraving cannot shew. The sepals are the ornamental portion of the flower, the dorsal sepal being the smaller limb, and the inferior sepals joined together until almost the base of their pointed-like prolongations. The petals are small and are nearly concealed in the tube-like orifice at the base. This is quite the normal characteristic of the genus. The flowers come in pairs, often in threes, from a peduncle about the length of the leaves. In this way the flowers only just clear themselves above the foliage. The leaves are spathulate and entire. They have a succulent appearance and are bright green.

It is a very neat growing plant, of easy culture, and coming as it does from the Andes in New Grenada, Columbia, and Peru, requires only warm greenhouse treatment. When the plants get of any size they are apt to lose some of their centre leaves, especially in the presence of an accumulated moisture during the winter months. Great care must be taken in this respect, else they will die off by inches until no art can save them. As a rule, it is safe practice to divide them into ordinary sized pieces, and less danger will be imminent. Indeed, as a rule, this kind of cultivation is more favourable to the development of larger and more persistent flowers, and should be adopted in all cases by the tyro and such growers as have not full confidence in themselves. Very cool summer treatment, with abundance of ventilation, must be the order of the day during summer, with copious moistenings. It is not safe to winter them in a temperature of less than 45 deg. Too great heat is bad.

GARDEN SEATS.

THE garden-seat engraved is a very elegant one. Its outline is agreeable and light, with the dog's head, the serpent, and the vine-leaf and fruit all prominently brought out in the design. There is nothing of intricacy about its parts, no confusion, but all simplicity, and beauty, and fitness combined. Besides being a handsome seat, its form is suited to give more than ordinary comfort to the lounger when resting from fatigue. The seat and back is made of spars of wood fitted into the cast-iron frame-

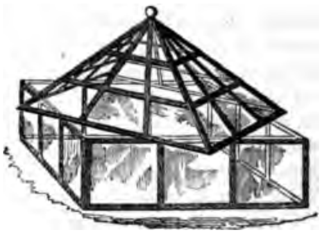


Ornamental Garden Seat.

It is a great improvement, as a seat, e Leicester pattern, and will challenge ble comparison with the Italian, Mo- or the fern and blackberry pattern which are all good enough, but not ;o agreeable form a point of view. y far the cheapest design of the kind, to the general efficiency of the seat, in commerce, and we recommend it to all who wish to have a good-looking thing out of doors, suited for rest and comfort. To keep all seats in good condition, they must be ferquently varnished or painted. Indeed, it is a matter of economy to attend to this, to the special needs about gardening operations.

HAND GLASS.

E old hand-light is not to be despised among other candidates for a similar purpose. The frame-work ıtedly looks a little too expensive, ɜn, in cases of accident, the panes of e easily repaired. Once break a globu- s or cloche, and there is an end to it, : old hand-glass will, with repair and and a lifetime. It is very useful for nodating small plants, or cuttings of hardy plants, or of plants all but hardy, in respective localities. For such things as pinks, antirrhinums, pentstemons, and chrysanthemums in a young state, it is admirably suited, and so it is for cauliflower plants, for lettuces, and parsley, all of which require some kind of protection to keep them in health, and accelerate their growth. By being made in the way shewn in the engraving, air on favourable occasions can be admitted. In fact, when the bell-glasses remain to protect the plants from wind, the top of this hand-glass can be moved to the angle, so that the constitution of the plants under its protecting influence is strengthened in comparison to the same plant coddled, and necessarily coddled, to protect its being uprooted or partially destroyed. All things considered, the hand-glass has claims upon us both for fitness and stability.



Hand Glass.

Work in the Garden during October.

From "THE VILLA GARDENER."

THE KITCHEN GARDEN.

STORE all root crops, if not already done, such as carrots and parsnips, beet, and salsify where it grown. Also late potatoes. The best mode of keeping these is to lay them in layers in cellars, or in the ground alternated with earth. This preserves their flavour. Some prefer leaving parsnips in the ground, to be taken up when wanted. They are held to be sweeter so treated. But it hinders the soil from being properly cultivated, and is rather an untidy mode of procedure. Unless, therefore, for convenience, the plan is not to be recommended.

The great business of the month is with the soil. As early as possible, every vacant space of ground should be trenched or dug up. The surface should be left as rough and lumpy as possible. Simply invert the earth, and by no means smash it with the spade after it is turned over. In summer digging, the usual practice is to bang, cut, or drive the upturned earth into fineness. All this must be carefully avoided now. Even the spadeful of earth must be turned gently, for fear of breaking it down in the process. There is a twofold reason for all this care—to expose as much surface to the air as possible, and prolong the season of roughness to the utmost limits. If soil is broken fine when inverted in winter, it soon consolidates into hardness. Snows and rains batter it down, and it might almost as well have been unturned. But left rough, every rain-drop pierces, every sunbeam warms, every fog and dew nourisheth it, and it is gradually mellowed by natural forces into the finest tilth. There is no means of manufacturing such perfect tilth by art. Neither is it needful. All that we are called upon to do is to throw up rough clods, and let the elements break, mellow, quicken, and enrich them. Every day that we leave an atom of vacant ground unbroken, we lose a whole host of natural workers, that only want to fall on the fresh earth, and prepare it for the best seed-beds and the most genial root-runs. Therefore, if we would not lose these great mechanical and enriching forces—sun and shower, and the moving air—let us dig and trench our ground deeply, and throw up a rough surface at once. This is also a good time to apply manures. Before the rains and snows of winter soften the land, let us bear these fresh burdens over it. Nothing injures land like wheeling or treading over it when wet. It breaks down its spongy texture, and binds with bands of iron-like hardness and obstinacy. Such treatment is simple ruin to heavy or wet land, and sure injury to all. If the manure cannot be got on before the rain has made the ground sticky, the wheeling must be deferred till the frost comes. Under such circumstances, it may be best to dig the land twice. Clear all rubbish off the surface, and dig it at once. When the frost comes, manure it and dig it again. Land often suffers much while waiting in a sodden or hard state for the frost, to enable it to be manured before it is dug. Better far to dig it twice.

This month is likewise a good time for draining gardens. No garden should have stagnant water within 5 feet of the surface. The best mode of draining will be found in other portions of THE VILLA GARDENER. Suffice here to state that gardens must be warm and dry; that drainage makes them both; and that this or next month is a good time, perhaps the best, for this work.

Celery.—Take up a week's supply at a time, and store in earth. Protect the crown of the ridges with an inch or two of dry dung, fern leaves, or straw, to keep away frost. Earth up late crops, leaving a good head of leaves out of the earth to afford them protection, and also sprinkle them over with litter in very severe weather.

Cauliflower and *Walcheren Brocoli*, planted on early potato ground, will now be shewing small crowns. Cut or pull the plants up as soon as the flowers are ready for use, and keep them in the cellar or pantry till wanted. Tie the leaves over those forming small flowers to throw slight frosts off. Cauliflower plants planted in handlights and Rendle's Protectors last month, will now need protection in severe weather.

Lettuces and *Endive*, in the protector will be able to take care of themselves, and they will need no air from this time. They grow faster, and are sweeter and crisper without it. Boards or tiles may be laid over the endive, instead of glass, to blanch it. Late crops of lettuces may still be planted in these. If any late lettuces or endive is still in the garden, a dish of them may be kept sweet and good in pantry or cellar for a month, by simply letting their roots touch water and keeping their tops perfectly dry.

Cabbages may still be planted out for summer use, and those planted last month hoed or earthed up—that is, about 3 or 4 inches of earth drawn to each side of their stem. Many useful cuttings of rhubarb and seakale, and even asparagus, may be had, by potting or boxing a few roots, and placing them in a warm nook or corner in the kitchen, cellar, or garret near the chimney. Seakale must be kept dark; but

two do better in the light. Lacking such
stable, cowhouse, or open shed or dunghill,
utilized as sources of shelter and heat for
such tender morsels. If a bottom heat of 55
gs. can be had, so much the better. But
nts will grow in a much lower temperature.
pots, space, &c., place an old box, wide-
pot, or even a few boughs round a few roots
or put a few protectors over them, and
ves or dung round to a height of 18 inches
t, and the fermentation will force out the
oots of rhubarb, seakale, &c., which make
us change of vegetable from November to
r.

s a good season to remove the exhausted soil
surface of asparagus beds, and replace it
n 4 to 6 inches of good fresh dung.

ing.—The first crops for next year should be
nis month. Mazagan beans, in rows 2 feet
id the beans 2 inches asunder and 3 inches
ould be planted in a warm sheltered situa-

—Sow Tom Thumb at the foot of a south wall,
sloping bank. Also a border of Carter's
op, in rows 3 feet apart. Sow thickly, to
r losses, first wetting the peas, and sprinkling
th red lead, as an antidote to the ravages of
To make security doubly sure, draw deep
least 4 inches in depth, open them wide, and
the sides and bottom before sowing with a
of equal parts of dry soot and quicklime.
w the peas, and over them sow 2 inches of
furze. Over this place the earth, heaped into
v ridge. The object of all this is to destroy
r the vermin that delight to prey upon winter
Rats, mice, snails, worms, birds, all attack
Before the peas are expected through, dust
es with another sprinkling of soot and lime.
ll skin alive or kill the black slugs that are
wait for the first peas that shoot, which is as
g to them as the first duck and green peas are
No sooner do the peas rise above reach of the
ian the birds, especially the sparrows, are
devour them. Dash more soot and lime
em to make them nauseous, and still further
the birds with a forest of stakes, and a few
whins near the bottom. Attention to all
atters will meet its reward in a good harvest
green peas.

ls will grow especially among cabbages,
spinach, and autumn onions, &c., even in
ber. Keep the hoeing going among all such
remove all dead or dying leaves instantly;
hoe and rake, or turn and renew gravel walks,
order, cleanliness, and neatness be everywhere
it. Even kitchen gardens should be as well
winter as in summer. If this is attended to,
garden is well filled and properly managed,
never fail, not even in November, to afford
and pleasure.

THE FRUIT GARDEN.

Clear it of any fruit remaining. In cold localities, late fruit often lingers on the trees to ripen till this month. Unless it is carefully and thickly matted, it should not be risked out of doors any longer. With efficient protection, Morello cherries, currants, and even Imperatrice plums, on north walls, might be preserved on the trees till December. The great dangers to guard against are frost, wet, and vermin. If these are shut out, such fruits will probably keep a little longer, and they become specially valuable for late desserts, or for sale, at such unseasonable times as mid-winter. All late varieties of apples and pears should be gathered at once, whether ripe or unripe. Better to store them green, than have them finished into rottenness by the bite of the frost. As soon as the trees are cleared of fruit and leaves, pruning and training may be proceeded with. The remark does not, however, apply to tender fruit—that is, peaches, nectarines, apricots. The pruning of these is deferred till the spring, to keep the fruit blossoms as backward as possible. If pruned closely now, the chances are that the bud or two left at the base of the cut shoot would burst into blossom early in February, and be scathed into the blackness of death by the cutting winds of March; whereas, by leaving all the wood till February or March full length, a few blossoms that we can afford to spare may be forced into bloom at the extremities of the twigs. But the flowers at the base will sleep on till April, when they can open in safety and grow up to fruithood.

Cherries, *Plums*, *Apples*, *Gooseberries*, and *Currants*, may be pruned at once. In the southern counties I would recommend pears, grown on standards, pyramids and espaliers, and certainly on walls, to be treated as peaches, &c., and not pruned till the spring. In the north they may be pruned now. Nothing can be simpler than what is called spur pruning. Until trees have filled the space allotted them, about a foot of young wood is laid in at the end of every branch. Then all along each leading shoot, each piece of the current year's wood is cut off to within two or three buds, generally from ¼ of an inch to ½ an inch of its base. This is all. Apples, pears, currants, and gooseberries are generally pruned on this plan. The young wood is spurred in, and the leading shoots laid in, or left to grow. This concludes the pruning and training.

Peaches, *Nectarines*, *Plums*, and *Morello Cherries* are pruned on quite a different principle. As much old, worn-out, exhausted wood is annually cut out as possible, and its place is filled up with as much or more new. And the new wood is laid in and shortened—not spurred. Provision is made on such trees for the winter pruning during the previous summer. Wherever a vacancy is seen, or a debilitated branch discovered, young growing shoots are tied in, with a view of supplying its place. The pruning of such trees is by no means so simple as the others. The whole tree must be carefully scanned before cutting at all. See if any large branches must be removed. They should be cut out first. And so on in gradation, from the greatest to the least. It will thus often happen that small branches will have to be left that it might be desirable to remove. There are but two great arts in this mode of pruning. One is, to keep the base of the trees well furnished, the other, to cover the wall all over with fruit-bearing wood. The first object well nigh provides for the second. Hence the common saying—Furnish the bottom of the tree well, and the top will furnish itself. Towards the full furnishing of both, however, something more is needed than the removal of old wood and the laying in of new. The young shoots must be stopped back, to force them to break freely into wood along their whole lines. As a rule, 1 foot is long enough for the young shoots. And from each shoot of one year, two, as a rule, sometimes three or more, ought to be taken, one from the bottom, and the other near the top, for the next. This will give a lot of shoots for retention or removal at pruning time, and on the wisdom or folly of that choice turns the whole question of skilful or unskilful pruning. I hope that all readers of THE VILLA GARDENER will become the former. To this end, in addition to understanding the foregoing plain instructions, they must provide themselves with a sharp knife, and learn to make a sharp clean cut, sloping from the bottom of the bough outwards and upwards, at an angle of 45 deg. Begin at once on the gooseberries, currants, apples, &c., and rough cherries; and by the time you have reached peaches, &c., your practice will have led you up to perfection, if, indeed, that is ever reached.

Nailing, or *tying in*, and *training*, follow pruning. The chief points here are to please the eye, provide sufficient space, and allow the shoots room to swell. Straightness or regular curves are most pleasing to the eye. The distance apart may range from 4 inches to 1 foot, and no tie or shred should be so tight as to run any risk of cutting the shoot before the end of the season. Excess of ties or nails are also to be avoided, as are gaudy colours of "listing," or varieties of colours, or wide strips, as if meant for braces. Small uniform-sized quiet coloured shreds should always be used. I am the more particular about these trifles, as I have been in villa gardens where shreds, nearly 6 inches long and 2 inches wide, and of all the colours of the rainbow, fixing up trees and roses within view of the drawing-room window, have made the walls look like a rag shop.

Planting fruit trees.—This is the month, above all others, for this purpose. Evaporation is at a minimum, or will soon be, and the trees, deprived of their usual supply of sap through their roots, are swathed round with dense fogs. The earth is also comparatively warm this month. The temperature at 1 foot below the surface is 45 deg., while in January and February it is but 40 deg. The effect of 5 deg. more heat upon the roots is great. It starts them into immediate growth, and enables them to get before the tops. Whereas, in trees planted in spring, the order of growth is reversed, and the newly transplanted tree is often pumped dry of fluid before the roots can be got into action. It is a popular error to suppose that the roots of trees rest in winter. Unless frost-bound, they work and grow without ceasing, all the year round. Hence trees transplanted now root at once. And it is of immense importance to have three months for rooting before the top is called upon to move. With so long a start, the roots will have been sluggish, indeed, if they have not found sufficient supplies for the sustentation of the top. As a rule this is well done, and trees planted now grow away next season without let or hindrance. The mode of planting is simple enough. Having prepared and made the earth firm, to a depth of 4 to 8 inches from the surface, according to the size of the tree, place it upright on this prepared space, and stake it firmly, if a standard. Fix it to the wall or espalier, if a trained tree, as the case may be. This fixing of the top, leaves both hands free for planting. By firmly fixing the tree at this stage, we also avoid the danger of staking through the best roots, which is such a common cause of failure in planting. Proceed to spread the roots regularly over the ground, cutting off any bruised portions with a sharp knife, and taking care not to tread upon them. The roots should lie horizontally, or, if inclined at all, it should be upwards, and not downwards.

The soil should be broken fine, and scattered over them with care until all are covered over, the upper with, say, 3 inches of earth. If the ground is at all dry, work the roots and the soil into closer union with a thorough watering. But by no means tread upon either roots or earth. Cover the entire roots over with, say, 3 inches of a mulching—that is, any non-conducting materials, such as long dung, straw, fern leaves, cocoa-nut fibre refuse, or even leaves, to keep the heat and water in, and the frost out, and encourage immediate and incessant growth. What to plant in, and how much depth is needed, will probably be treated of in other papers. Sufficient here to say, that 18 inches or 2 feet deep of good loam will grow any fruit tree to the highest perfection. As to the width of borders, as a general rule, take the height of walls or espaliers as the measure. For a 6-feet wall a 6-feet border, a 10-feet wall a 10-feet border, and so on, for pyramids somewhat less width than the height of the trees is sufficient. For a 7-feet tree a 5-feet border answers well. Cordons, again, may be grown on mere lines of borders like themselves. A cordon 4 feet long will grow very well on borders 2 feet wide. But the best place for these rope trees is skirting the sides of other borders, where no special preparation need be made for them. In planting wall trees, it is important to keep the boles 6 inches from the wall, else, if placed nearer, it will be injured by pressure against the bricks as the tree grows.

Though this is the month, *par excellence*, for planting, the work must not be done should the earth be in a wet or sticky state.

ing.—This important operation should to at once. The reason, and the mode already been given last month. In this have a sure antidote to barrenness. By f the season, fruit growing and regular it have left the regions of uncertainty for rough the aid of root pruning. The wever, must not be carried to excess. are fruitful, let well alone. Only barren he knife upon their roots. Better than ay end in failure. A lesson in this direction in my boyhood, has never been forgotten. ht was driving home the spokes of a wheel. looked on, "That's well done, *very well*, , sir, I will make it better than *very well.*" ame the mallet with splitting force, and e to *splinters*. Leave well alone is never nt than in regard to fruit-bearing trees. g is but the means to the end—fruitfulness. excess of fuss or folly, or both, to use the the end has already been gained. Any fected with scale or bug, ants or aphides, be thoroughly cleaned. After trying ms it is somewhat humiliating to have to to a tiny scrubbing brush and strong soap these, in nimble fingers, are the pest f vermin, and removers of filth. It is mother scale with paint; but before every overed they might be scraped or scrubbed should likewise be scrubbed and washed hinks and holes filled up, and a raid made against vermin and dirt. Cleanliness is est aids to general culture, and essential fruit growing.

ies, *Raspberries*, *Gooseberries*, and *Cur-* any fruit trees that are weak, may still be with manure or rich composts, to impart strength and recoup such plants for the y demands made upon them.

ed in rooms, attics, cellars, or special fruit ld be preserved at an even temperature of d kept in the dark. Examine it every emove the first speck of decay. Rottenctious, and spreads among fruit like fever Decomposition developes a lower form of opagates itself by millions of germs and must be checked at once, and before its ipe enough to grow on or in other fruits. me reason decayed fruits should be lifted oved softly and carefully, so as not to disore germs. But no decay should be perdirt nor dust of any kind allowed among nliness is the secret of keeping fruit, as parent of health, amid all forms of life.

HE FLOWER GARDEN.

glory has departed! We must make up, in ness and cleanliness, if possible, for the uty. Sweeping, rolling, and, it may be, grass, weeding, sweeping, hoeing, or, it may be, top-dressing of gravel. The clearing away of all summer dead or dying flowers, and the manuring and digging of flower beds, form the routine work for the month.

Nearly all the pelargoniums may be wintered, if, when they are taken up, the plants are roughly cut in, and the roots stowed away in pots, pans, or boxes, in dryish earth, in garret or cellar, safe from the frost till the spring. They will keep better with hardly any water. Of course they are easier preserved in protector, hand-glass, pit, frame, or glass-houses. But those who have neither, need not despair of wintering them, as I have stated. Choice and variegated varieties should be carefully potted and placed in the window or glass house till the spring.

Those who wish for a flower garden all the year round, must proceed to fill it afresh this month, with winter and spring plants. Christmas roses, golden aconites, dog-toothed and other violets, early heartsease, dwarf phloxes, such as verna, and others, snowdrops, crocuses, early tulips, anemones, scillas, early Forget-me-nots (Myosotis dissitiflora), alyssums, arabises, herbaceous candytufts, aubrietias, primulus, polyanthuses, hepaticas, daisies, hardy auriculas, &c., are among the most useful for this purpose. With these and hardy annuals, and a few dwarf flowering or foliage shrubs, a grand display may be made in the flower garden.

Scotch kale are also much employed for the winter and spring decoration of the flower garden. But (it may be prejudice against their cabbagy associations) I cannot recommend them to villa gardeners. Have a few in the kitchen garden, if you will, but keep them away from the drawing-room windows.

Planting of *Roses* and *other shrubs* and *trees*. All that has been urged in favour of the November planting of fruit trees is equally applicable to the planting of flowering shrubs and trees.

For roses the soil can hardly be too deep, nor rich, nor stiff, unless it is sheer clay. They often do well even in the latter, if it is well drained and enriched with manure. Trench up all ground intended for roses, to a depth of 2 or 3 feet. Mix with the soil at least 6 inches—1 foot would be better—of strong farmyard manure, and, if the land is light, add a layer of clay 3 inches deep. Plant at once in such a mixture, and mulch it as for fruit trees, and prepare your boxes for exhibiting your villa grown roses at all the local shows next season. Don't prune newly planted nor any other roses at present, nor until February. For the reason why, see Peach Pruning for this month. Tea roses on walls and in flower beds, should be protected with a thin coating of straw, fern leaves, &c.

Rose Stocks for budding.—Collect and plant in rows 1 yard apart, and 4 inches from each other. Choose the darkest coloured brown briars in preference to any other, as there are dog roses, *and* dog roses, and all are not alike sound, genial to our favourites, nor long lived. Prune the roots off nearly close, cut the stems to the desired height, from 2 to 4 feet are suitable sizes, and fix them to a strong line or horizontal rod. They will need no other attention but keeping clean till next May or June.

Planting of *Shrubs* and *Ornamental Trees*. The ground for these should be carefully dug and trenched, all weeds and roots of trees destroyed, removed or reduced in number, and if poor, it ought, unless for conifers, to be enriched by a liberal dressing of well rotted manure. Ornamental trees and shrubs need all such aids as these at planting time, especially near towns where the roots are cribbed, cabined, and confined, amid brick walls, and their tops are daily dusted with soot, and smoke-dried like hams in a chimney. A few rich roots would strengthen them to resist all these untoward influences, and to make way in spite of them. Portugal and Common Laurels, Hollies, Aucubas, Laurustinus, Lilacs, Syrangas, Laburnums, Berberries, Dentzias, Box, Thorns, Arbutus, and even Planes, Maples, Limes, Chestnuts, Oaks, grow as rapidly again in such well prepared bottoms, as they do in soils unenriched and undug.

Trees and shrubberies should be thinned and pruned when necessary during this month. It is wise to plant thickly for effect, but equally necessary to thin quickly and regularly, to ensure permanent blinds, or abiding beauty. Shrubberies ought to be pruned every year, with as much regularity and care as our fruit trees.

Plant out hollyhocks, wallflowers, and Brompton stocks. Divide and transplant phloxes, asters, delphiniums, pæonias, or other fibrous perennials or biennials. Dig herbaceous borders, re-name the plants, and let each tuft or patch of bulbs be carefully marked and distinctly labelled. Hyacinths, narcissuses, &c., may be planted in the mixed herbaceous garden or borders. Patches of nemophilas, virginia stocks, limnanthus, and other annuals, may also be planted in vacant spaces, so as to have a good supply of beauty in such borders early in the spring.

PITS AND FRAMES.

As bulbs, violets, and other plants advance in these structures, and are removed from them to the glasshouse or parlour window, etagères or mantelpiece gardens, fill up with choice pinks, carnations, auriculas, pansies, &c., from out of doors. Choice varieties of these should be wintered under glass; give all the air possible without admitting frost. Cover with mats in frosty weather, and water with great care; applying the water to the roots only, and keeping leaves and stems, and especially the hearts of carnations, &c., quite dry.

Verbenas.—Some of the old plants may be potted from the garden and stored here. They often form highly ornamental subjects for the window, and most useful reserves for spring cuttings.

Cinnerarias must not see frost, and as they will be growing first, and probably shewing flower, they will require liberal waterings.

Chinese Primroses.—Remove to the glasshouse or windows of dwelling-house. Pits are too cold and damp for these after this season of the year.

Herbaceous Calceolarias.—Treat like cinnerarias.

Shrubby Calceolarias.—A few of these carefully potted up out of the garden, will often go on flowering all winter in the glasshouse or parlour.

Pelargoniums.—Pot and place them here from the garden, and remove to glasshouse when established, or keep here all winter. Variegated pelargoniums, deserve some extra care. If a protector or small frame could be devoted to them, and the roots could be plunged in a gentle bottom heat, derived from 2 feet of tan or dung for a fortnight or three weeks, to fill the pots with fresh roots, these would form ornaments of the highest order in the parlour or glasshouse throughout the winter.

THE GLASSHOUSE.

This will now be gay with chrysanthemums, while the shelves will be spring-like with the glow of Chinese primroses, Zonal pelargoniums, and scarlet salvias, while bursting camellia buds, and probably some heaths, coronillas, cinnerarias, and arums, will give a liberal supply of bloom for this dull season. Chrysanthemums must be liberally watered, and be exposed to as much air as possible when the thermometer exceeds 40 deg. The great object now is to prolong their period of glory, until camellias, azaleas, and other plants are ready to fill their place. From 40 deg. to 45 deg. should be the temperature of the glasshouse in winter. In addition to as much blossom as possible, this house is often the *omnium gatherum* for all the bedding plants on the establishment throughout the winter. All the pelargoniums, verbenas, ageratums, petunias, heliotropes, calceolarias, echeverias, and other cuttings or roots, are crammed in here. Even the root of dahlias, Marvel of Peru, gladioluses, &c., are also stored in the general dormitory. In such cases, great care is needed to carry such a miscellaneous freight safely through; a cool dry regimen is likely to be the most successful. No growth, or as little as possible, should be the motto. To preserve them as they are, is the one thing needful, until brighter skies and warmer days beam upon them. It seems a mockery to add a caution against over-crowding, still it is needful. It is wiser to keep one plant well than six badly.

Give the best places to the choicest plants, such, for instance, as show and fancy pelargoniums, heaths, &c. Thus the former may now require a final shift. Keep them near to the glass, to ensure a strong short jointed growth.

Give a little fire on wet, cold, dull days, and open the lights with it, so as to drive out damp, and ensure a thorough change of air.

Keep a sharp lookout for insects, and fumigate or pick them off at once; remove dead leaves; scrape moss from the surface of the soil; wash the pots, stages, and floor, with soap. Scrape, scrub, brush, and keep all things sweet, healthy, and clean.—*D. T. Fish, F.R.H.S.*

Arboriculture.

TREES AND UNDERWOOD BEST SUITED FOR PLANTING ON SEA-COASTS.

BY WILLIAM GILCHRIST, FORESTER, CLUNY CASTLE, ABERDEEN.

ME extensive plantations have recently been formed, both in England and Scot- n barren tracts within the influence of breeze; and our Continental neighbours so taught us a great lesson in the in- ble perseverance with which they have ne so many difficulties and succeeded planting of barren tracts and sandy where the soil was of the poorest tion, and considered altogether unfit growth of any vegetable product. oviding of artificial shelter by forming fences, sowing tree seeds, and then ng the ground with branches, or broom or whin seeds along with the eds, so as to shelter the seedling plants, en some of the chief causes of success, lly where the soil was light and inclin- drift-sand. About five years ago, on st coast of Ayrshire, I saw a planta- soil of this description. It consisted of Scots pine; where it was fully ex- o the blast there was not half a crop on the ground, and these were either up with sand, or their roots were left bare of soil. The trees appeared to ut ten years old, and what of them owing appeared to be in a healthy on.

soils along some parts of the sea-coast netimes found to be very suitable for wth of trees and shrubs, and in such here is little difficulty in growing any hardy trees, and even some varieties not stand the frost inland are found v well along these favoured shores; lly is this the case along the shores rary, Lochgilphead, and Loch Fyne. This is principally owing to these places being sheltered from the cold western blasts of winter and spring, by the range of hills lying between them and the main ocean.

One of the most difficult situations for the formation of a plantation on the sea-coast is to be found where the ground is low lying, or rising from the shore with a gentle slope, and at the same time exposed to the full force of the ocean-breeze. The difficulty can only be overcome by erecting *screen-fences* at such distances as will effectually break the storm and provide shelter for the young plants. These screen-fences should be erected with brushwood; the thinnings of young plantations, broom, furze, or anything of that description, that will make the fence open and allow the wind to pass through it, instead of passing over it, as in the case of turf or stone-dykes. Some of the cheap and hardy varieties of underwood, such as the common elder, sea buckthorn, willows, sloe, thorn, common whin, &c., should all be used. Of course, where these or any variety of underwood is found growing naturally, full advantage should be taken of it; but where there is none, it must be provided and planted at from 2 to 2½ feet apart, so as to act as nurses to the young trees which may be planted at the ordinary distance apart. This underwood, though absolutely necessary for a number of years at the first outset, must be always kept in check, so that the trees may have full scope for the development of both roots and branches.

If the soil is light, with a gravelly botto (as is often to be found on the west c Scotland), or dry barren sand, the kin trees to be planted must be principally of the pine tribe, such as the Pinus Pinaster, P. montana, P. Austriaca, P. Laricio, and Scots pine. Where the soil is loam or peat, with a mixture of sand, and the subsoil inclining to clay, the broad leaved trees may be used, such as the birch, elm, plane, alder, and Norway maple. All these varieties of trees mentioned have been thoroughly tested along the shores of the west of Scotland, and, if properly taken care of, they will in due time form valuable timber trees for which a ready market and a high price can at all times be had. In an exposed situation, such as has been described, where the trees are planted near to maritime residences, chiefly for ornament and shelter, besides the varieties already mentioned, some of the more ornamental trees and shrubs may be used, such as the laburnum, mountain ash, oak, ash, and beech; and for shrubs, the ribes, sea tamerix, hazel, elder of sorts, snowberry, privet, and common lilac. *When* these have succeeded so as to provide shelter, some of the evergreens and finer sorts may be introduced.

To provide shelter for these maritime residences, hedges will be found to be better than stone and lime walls; that is, unless the walls are higher than what it is intended for the trees or shrubs to grow. I have often observed that where the trees grow a few feet higher than the wall, the tops of them grow freely and are regularly furnished, while the branches parallel with the top of the wall appear as if a portion of them had been cut away. This is caused by the blast striking against the wall in full force, the wall being a resisting body through which wind cannot pass, it ascends to the top of the wall with increased velocity, and the higher the wall the greater is the force at the top, and of course its influence on plants is the more destructive. Screen-fences, composed of brush-wood, near to a residence have a bad appearance, and at the best are only temporary; but I have seen them used with good effect during the most severe of the winter and spring months. As before mentioned, the most effective shelter and fence for these residences is a good hedge, viz., a sunk wall or fence with the back sloping inwards, and a hedge on the top planted with sea buckthorn, beech, elder, or blackthorn. These hedges do not altogether resist the sea-breeze, but they tend to prevent it striking with so great force on a given point, and the salt spray is very much exhausted before it passes through a good hedge, and by that time will do no harm to any of the maritime plants.

Where the elevation rises abruptly from the shore and terminates in flat or table land, even though the situation be as fully exposed to the blast as the one previously described, there is little difficulty in forming plantations; for as soon as a few of the harder varieties of plants can be got to grow on the exposed side, so as to provide shelter, any sorts of trees that are suitable to the soil will grow, as the temperature is generally higher in these situations during the winter and spring months than it is in the inland districts.

In regard to the exposure of trees to the influence of the sea-blast, I consider that it is not the blast or sea-breeze, but the sea-air that is so damaging to the trees during the winter and spring months. Climatic influence acts on the vegetable kingdom as well as on the animal, and it is no uncommon thing in exposed districts of the west coast, during the prevalence of westerly and south-westerly gales, to see the windows crusted with salt like frost. When salt is in the air in such quantities as to leave its impression on the windows, it must of necessity be very damaging to the constitution of trees and shrubs. It is well known that salt used in moderate quantities is a very efficient manure, but if overdone, nothing is more damaging to vegetable life.

In speaking of the formation of plantations on the sea-coast, reference has often been made to the failure of the plants that were planted by a very enterprising gentleman on one of the islands of the Hebrides. But too much stress should not be laid upon the failure of that undertaking, as it was done under very adverse circumstances, and at a time when the formation of plantations was not so well understood as they are at present. The undertaking has been a success, in so far as it has proved that some trees will grow under the climatic influences of the ocean; and I have no doubt that, had the formation of this plantation been more judiciously and carefully done, it would by this time have been one of the monuments of arboricultural triumphs on the sea-coast. Some of the causes of failure may be here mentioned, such as the unsuitableness of the soil for the growth of any trees, a great part of it being deep moss, combined with a humid atmosphere, which keeps the soil always in a damp and spongy state. Yet, in that soil and situation, Pinus pinaster, maritima, and montana, trees that are said to grow best in light sandy soil, not only kept in life, but for a number of years after being planted appeared to be in good health. Of course none of the plants, except what are on the sides of ravines or some sheltered spots where the soil is more congenial, will ever come to be timber trees; but if they grow so as to provide shelter for the growth of timber trees, a great end will have been gained. Another cause of failure was the extent of the undertaking for one season. The formation of the plantation should have extended over a number of years, beginning with the most exposed parts, and planting such trees and shrubs only as would provide shelter. As soon as shelter was thus obtained, the remainder could be planted, and even some useful timber trees might be introduced into the exposed parts, as they would then be sheltered by the shrubby sorts that were formerly planted. In the absence of this system, screen-fences ought to have been adopted, irrespective of the extent of the plantation. The packing and shipment of the plants in so large a quantity would also be against their future success; for it is a well-known fact, that even in the most favourable districts for growing plants, the shorter time they are out of the nursery ground before planting the better.

Acclimation also exercises a very great influence on plants, whether they be planted inland or along the shores; but more especially would the influence of acclimation be felt on an exposed coast, or a bleak and barren island, where the soil, even at the best, cannot be said to be suitable for the growth of trees. In such a situation, to be successful in the formation of plantations, a home nursery must be established, and the plants grown from seed. Besides this, they must be what is termed "well handled," that is, carefully transplanted, so that they may be well furnished both with roots and branches. This is the more necessary, as a number of the trees that are most suitable for growing in exposed situations are what may be termed "sparse" rooters, and are difficult to transplant, even in the most favourable situations. The situation chosen for a nursery should be in an exposed place and not sheltered more than is absolutely necessary for the healthy growth of the plants.

In a report on sea-side planting, for which the Highland and Agricultural Society awarded their gold medal, special reference is made to plantations that have been formed on the northern extremity of the county of Norfolk, at an altitude of from 200 to 500 feet above the level of the sea. The surface is reported as generally being poor and the subsoil a hard ferruginous gravel. The plants used were goat-willow, alder, birch, sycamore, Scotch elm, and two varieties of the Pinus pinaster. The formation of the plantation, including planting and fencing, is reported as having cost upwards of £10 per acre. The success of the undertaking is attributed to the preparation of the ground by trenching 18 inches deep; erecting screen-fences of brushwood, &c., 6 feet high; carefully preparing the plants; having them well furnished with fibrous roots before planting; and having the ground cleaned by hoeing for the first two years after planting.

The cost of the formation of these plantations appears to be very high when compared with plantations formed on the north coast of Morayshire by Mr Gregor, and reported by him as having cost £232, 18s. 7d., for 298 acres, or, on an average, rather less than 16s. per acre. The plants used were Scots pine and larch. However, the writer states that the unusual small expense of these plantations was owing to "the ground being soft, with little or no surface herbage, rendered it suitable for small plants, which were planted by the hand-iron, by people in the vicinity much practised in the work, and who could plant an acre each daily, on such ground without difficulty. The plantations were also made at a time when the price of nursery plants was under the usual rate;" and also, that "the expense of fencing these plantations was very small."

In specifying the kinds of trees and underwood best suited for planting within the influence of the sea-breeze, our remarks must be understood as being chiefly applicable to the west coast of Scotland, and none will be recommended but what have been thoroughly tested, either along the Ayrshire coast, the shores of Campbelton, or on the islands of Arran and Bute; and first amongst these, the palm of honour must be awarded to the

PINUS PINASTER and its varieties. This tree was introduced in 1596, and is common throughout Europe and the shores of the Mediterranean. It is generally found in plains near to the sea, and on sandy soils of the poorest description. It has been successfully grown on the coast of Galloway, and on the northern coast of the county of Norfolk, where, as Mr Gregor, in his "Arboriculture," states that "some of the best specimens of the tree in Britain are to be found, standing nearly 80 feet high, with trunks 12 feet in girth. Many such trees stand at Westwick Park, where few other species of trees would become timber." It has also been most extensively used by our Continental neighbours in the successful formation of plantations on the sea-coast, and on large barren tracts of drift sand, where, previous to its cultivation, scarcely any plants of a ligneous nature could be found to grow. Its accommodating nature in regard to soil and situation was also distinctly proved in the success that has attended its introduction to some of the islands of the Hebrides, where, under very adverse circumstances, and in soil entirely uncongenial to its nature, or at best, very different from that of its native *habitats*, it has shewn such symptoms of success as will ensure its further introduction at no distant period. On the Continent of Europe, its wood is principally used for the production of rosin, tar, and turpentine, and for the ordinary kinds of carpentry and fuel. The pinaster has a very strong *tap-root*, which, in loose, dry, sandy soils, descends perpendicularly into the ground, seeking its nourishment and fixing its anchor or stronghold in a strata that is not reached except by some of the broad-leaved trees. This is a peculiarity which makes it, unless frequently removed in the nursery lines, very difficult to transplant successfully; but this very peculiarity is what makes it, above all others of the pine tribe, a suitable plant for barren sands and sea-side planting. It grows very fast, but is rather loose in its habit, and is very often "kneed," or blown a little to the one side; but it very rarely occurs that any of them are uprooted by the storm. One of the varieties of this tree—Pinus Pinaster minor, or P. P. maritima—is said to be hardier than the species. It is chiefly distinguished by the smallness of its cones, and the shortness of its leaves, as compared with the other. It is found growing on the Continent along with the P. Pinaster.

The next in order of rank amongst the pine tribe are the Pinus montana or pumilio, P. sylvestris, P. Austriaca, and P. Laricio. The P. montana is of a low-spreading, bushy habit; a native of Europe; abounds on the Alps, Pyrenees, and other high mountains; was introduced 1779. It stands the exposure of the sea-breeze; but is of little use except to cover the ground so as to produce shelter for the more useful plants. It prefers a dry soil and a high altitude, but will grow on moss, or on calcareous or chalky soils, and at a higher and more exposed altitude than any of the other pines. The Scots pine, P. sylvestris, is also very accommodating as to soil and altitude. The merits of the Scots pine are so well known amongst arboriculturists, that they do not require to be set forth in a paper of this kind. The P. Austriaca, while growing freely on light sand or gravelly soils, will also grow well on wet or heavier soils than either the Scots pine or the Pinaster. However, it prefers a deep alcareous sand, and a southern expo-

The Austriaca was introduced from
remia forest of Austria in 1835, and is
-growing, noble tree. It grows freely
the shores of the Firth of Clyde, and
noble specimens of it are to be seen
ghout England. For producing shelter
ming a dark background in the land-
, it is unsurpassed. When allowed to
in an open situation, its branches are
spreading and very picturesque. Its
r is strong, tough, and resinous, and in
tive country is said to be valuable for
ng the effects of change from moisture
ness. If this characteristic holds good
timber grown in this country, it may
me to be valuable as material for rail-
leepers, &c. But for this purpose it is
be surpassed by the Pinus Laricio, one
most valuable and fast-growing pines
as yet been introduced. Although in-
ed in 1759, it has not been so
ghly tested on the sea-coast as the
pines we have already mentioned; but
ver it has been carefully planted there
given satisfaction. Being a native of
land of Corsica, where it frequently
the height of 140 feet, it will in course
e be regarded as one of our best mari-
lants. It is very difficult to transplant,
equires a good, open, loamy soil to
success. The wood of it is soft and
wrought, of a whitish colour; the heart-
is darker, and is found to be of very
duration. It is used by the French
nment for shipbuilding, and, under
able circumstances, is fit for masts for
vy in thirty or forty years. I have not
he Corsican pine planted to any extent
the sea-coast; but specimen plants of
to be found growing within the influ-
of the sea-breeze in different parts of
yrshire and Wigtownshire coasts, and
n the shores of Campbeltown.

larch (Larix Europæa), silver fir (Picea
ata), and Norway spruce (Abies ex-
are sometimes found growing remark-
vell within the influence of the sea-
, but they cannot be relied upon unless
red by other trees. In fact, the spruce, though growing within the influence of the sea in its native country, seldom attains even to mediocrity in the west of Scotland when exposed to the sea-blast. The American spruces, A. nigra and A. alba, are more to be depended on, but they do not come to be so useful timber trees. Where the soil is suitable for hard-woods, the larch may be grown profitably amongst them; but on exposed sandy soils it will not succeed. The same may be said of the silver fir; but wherever a suitable situation for either of them can be got they should be introduced, as there are some fine specimens of them along the Firth of Clyde, and they soon come to be profitable trees when grown in a suitable situation.

We have given the preference to the pines for planting within the influence of the sea-breeze, in the full assurance that they are the best, both for shelter and profit; but it cannot fail to be observed that the broad-leaved or hardwood varieties of trees form the greater part of the plantations along the west coast of Scotland and the islands we have mentioned. Conspicuous amongst these, and growing where their roots are sometimes submerged in salt water, are the sycamore (Acer pseudo-Platanus), a native of Switzerland, which withstands the sea-breeze better than most trees. It is rarely known to grow one-sided, even in the most exposed situations, where it is often seen standing alone. The Norway maple (A. platanoides) is a native of the west coast of Norway and the shores of the Baltic, where it attains large dimensions, growing close to the sea-shore. The Scots elm (Ulmus montana), when exposed to the sea-breeze becomes a low-spreading tree, of little value for timber, but produces good shelter, and will thrive in almost any sort of soil that is not water-logged. The alder (Alnus glutinosa) is specially adapted for growing in the wet and marshy places along the shore. It stands the sea-breeze well, and has been used as a nurse in dry situations; but for this purpose it is surpassed by A. incana, the hoary-leaved alder, which forms a very handsome tree, and will grow in either dry or moist soils. The birch (Betula alba) one of the most useful trees for growing in exposed situations; but when grown, fully exposed to the sea-breeze, it seldom attains that graceful weeping form which makes it such a general favourite in landscape scenery. As a maritime plant it is most useful for planting in a dry peaty soil, with a rocky bottom. On the island of Scurba, birches are growing out of the rocks, where they are fully exposed to the ocean-blast. The foregoing (with the exception of the A. incana, which has only been recently introduced) are what we have found to be the healthiest and most suitable trees for growing on the west coast of Scotland, in situations where they are fully exposed to the influence of the sea-breeze; but there are others that are found growing freely in some of the more sheltered nooks. Amongst these are the beech (Fagus sylvatica), common hornbeam (Carpinus betulus), ash (Fraxinus excelsior), and oak (Quercus pedunculata and sessiliflora). The two former are well suited for planting in a mass, or forming hedges; but I have not seen them succeed as timber trees when fully exposed to the sea-blast. They are, however, useful for planting as a mixture with other hardwood trees for shelter, as they retain (when young) their leaves during winter. The ash, when grown in good soil and a little sheltered, forms good timber trees, and ought to be cultivated wherever the situation is suitable. The oak will grow exposed to the sea-breeze; but, unless in very favourable situations, it becomes very "scraggy," and assumes a dwarf habit. If the soil is suitable, it may be cultivated profitably as copse-wood.

The willows also grow remarkably well on some parts of the sea-coast; in fact, they are so tenacious of life that they will grow almost anywhere; but they never succeed and become timber trees on the coast, except when grown in the hollow places by the side of running water. These water "rills" are very common on some parts of the coast; and where they occur, no better situation can be got for the willows. The sorts best suited for timber trees near to the coast are the Bedford willow (Salix Russelliana), Huntingdon willow (S. alba), and the goat willow (S. caprea). Besides these, a great many of the dwarf varieties of the Salix are suitable for growing as underwood.

Some of the poplars are said to grow well on the sea-coast, but I have not seen such success attend any of them as would warrant their being recommended as maritime plants; however, if they are sheltered and the soil suitable, they will ultimately become profitable.

Amongst the underwood best suited for planting within the influence of the sea-breeze must be enumerated a number of the semi-dwarf trees. I will only give the names of these, dividing them into two classes, viz., those that are suited for the general formation of plantations, and those that, though equally hardy, are, by the price that is still charged for them, only suitable for ornamental planting. In the first class may be included the laburnums (Cytisus Laburnum and C. alpinus). Mountain ash (Pyrus aucuparia) is one of the most admirable trees for planting as a nurse in exposed plantations: it will grow in any soil and in the most exposed situations, is a free grower, and forms excellent copse-wood. Common elder (Sambucus nigra), black or sloe-thorn (Prunus spinosa), sea buckthorn (Hippophæa rhamnoides), which is the best of all deciduous shrubs for standing the sea-breeze: it seems quite at home on the shore, and will grow in pure gravel, throwing out its branches to the sea; the hazel (Corylus avellana), common whin or furze (Ulex Europæa), and the privet (Ligustrum vulgare). These, along with the dwarf pines we have mentioned, will produce sufficient shelter and give a very pleasing appearance to a plantation, as compared with the bare-stemmed, stunted-looking trees that are so often to be seen along our shores.

The ornamental shrubs for sea-side planting are the bird cherry (Cerasus Mahaleb), the tamarisk (Tamarix), French tamarisk (T. gallica), common lilac (Syringa vulgaris), evergreen oak (Quercus Ilex), snowberry (Symphoricarpus racemosus), common holly (Ilex aquifolium), Laurustinus (Viburnum Tinus), red-flowering currant (Ribes sangui-

), the common Arbor Vitæ (Thuja occi- lis and T. Warreana). Besides these, nens of the Araucaria imbricata, Cedrus ara, Wellingtonia gigantea, Cupressus oniana, and Nutkaensis, and others of me class, are occasionally to be met with ng freely on the sea-coast; but they t be recommended except where shelter vided, either natural or artificial.

e Portugal and common laurel, Rhodo- on ponticum and its varieties, are also planted, but do not succeed unless red.

ore concluding this paper I would beg r a few general remarks regarding the ation of plantations on the sea-coast slands; and, first, the preparation of round. If rank whins or heath are ng on the surface, they should be burnt ; whins one year before planting, and at least two years. This is better than ing, as the natural whins and heath le shelter for the young plants; only, ins must be kept in check, so as not ure the young trees. Hard, "benty" d on "links," with coarse herbage, to be trenched at least 18 inches deep, e surface "spit" put into the bottom trench. This should also be done a lerable time previous to planting, so he ground may have time to consoli- Deep mossy or peat ground should e trenched, and, if possible, some of the under strata (be it clay, sand, or gravel) brought to the surface. If this is not practicable, sand or gravelly soil should be got and added to the surface, so as to give the plants a fair start. Where the ground is wet, it must be thoroughly drained before planting, as nothing is so injurious to plants as stagnant water. On drift-sand or sloping banks, much exposed to the sea-breeze, screen-fences must be provided. The plants must be well rooted, hardy, healthy, and, if possible, reared in the neighbourhood, and kept as short time out of the ground before planting as possible.

Planting operations ought to be done in the months of October and November, or March and April. In the case of mossy ground it is absolutely necessary that the planting be not begun before the latter end of March. Where the situation is exposed, plant close and thin, early and often. Prune the hardwood trees when young, so that they may grow compact, and not be liable to have their side branches lashed or broken with the wind. Keep the young trees at all times clear of brushwood or whatever tends to prevent a free current of air from passing through amongst them. This last is of the utmost importance, for unless trees are grown open and allowed to spread their branches, they will never spread their roots; and when the storm comes in all its fury, they become an easy prey to its ruthless blast.

TREES INTRODUCED INTO GREAT BRITAIN FROM THE EASTERN SEA-BOARD OF NORTH AMERICA.

BY J. E. BROWN, CRAIGMILL, STIRLING.

EVER since communication with the eastern shores of America began, they have been the chief source from which Great Britain has been supplied with an enormous quantity of the imported timber which she annually consumes; and when we consider that, of all the countries in the world, America can produce the greatest variety of useful trees, and the finest quality of timber known, it is not surprising that the introduction of forest trees from America into these islands has occupied the attention of our Arboriculturists. Up to the present time, I believe that almost all, if not the whole, of the really useful and economic trees found along the eastern sea-board of North America, have been introduced into this country, from time to time, during the last two centuries. As a whole, the trees introduced have not done so well as might have been expected; although, indeed, several kinds have succeeded remarkably well. This failure has, I believe, been more the fault of the planters than of the unsuitableness of the trees to our climate, and is to be attributed chiefly to want of attention to condition of soil and situation, so as to adapt these, as nearly as possible, to those in which the trees are found in their natural state. It is not, however, to be inferred, that although the additions to our Arboretum from America have not as yet been so successful as is desirable, that they will always remain so. As I am convinced that some of the American trees are yet to form an important part of the woodlands of Great Britain, it is therefore desirable that we should possess some reliable information in regard to the soils and general conditions in which we find the different kinds in their native forests, so as to be a guide to planters in this country.

Having, therefore, when on a tour through Canada and the United States, some two years ago, made a point of visiting and inspecting the great forests lying principally along the eastern sea-board of the country, and along the valleys of the St Lawrence and Ottawa Rivers, and noting particularly the different conditions of soil and situation in which I found the several kinds to grow healthily; and having seen to what purposes, economically, the timber of the different species is applied in America, I shall endeavour in this report to lay these points down as a guide to our future cultivation of American trees in this country.

I therefore proceed to refer to the chief kinds of trees found growing on the parts to which this report has reference; and in attending to this, my principal object will be to point out the character of their natural sites, as this seems of the most importance to planters in this country. Afterwards, I will give a few remarks as to how American trees should be dealt with in Britain, in order to their better success in future.

Black American Spruce Fir (*Abies nigra*). *Introduced into Great Britain in* 1700.—In its native soil, this forms a very graceful, tall, cone-shaped tree, its dark foliage producing a fine contrast among trees of a lighter shade. In its healthiest state, I found this tree growing on a flat-lying, cold-bottomed soil, with stagnant water here and there. In such places it had attained its greatest dimensions, being from 70 to 80 feet high, and 18 inches in diameter at 5 feet from the ground.

Its timber is extensively used for flooring purposes, and is shipped largely from Quebec for the Irish market.

It has not succeeded in this country to any important extent. To thrive well, it should be planted on a low-lying, dampish, sheltered site.

White Spruce Fir (*Abies alba*). *Intro-*

duced into Great Britain in 1700.—The largest specimens of this tree I found were about 45 feet high, with a diameter of 15 inches at 5 feet from the ground. I found it growing healthily on the slopes of ravines, where it had soil of a dry open-bottomed character, and where moisture descended from wet parts at a higher elevation.

The wood of this tree is used for the same purposes as that of the preceding fir. It is perhaps worthy of note, that the roots, owing to their toughness and durability, are used by the Indians in sewing their bark canoes.

It cannot be said to have done well in this country, as it has only as yet attained a comparatively small size.

Hemlock Spruce Fir (*Abies Canadensis*). *Introduced into Great Britain in* 1736.—This tree grows to a height of fully 100 feet, with a diameter of from 4 to 5 feet at bottom. The largest specimens I have seen were on the edges of swamps, where the soil is deep, with a constant supply of moisture to their roots. I have also met with it on dry and poor soils; but in such places I invariably found it to be of smaller dimensions, and seemingly, as it were, not at home. It, therefore, evidently succeeds best on soils of a deep and rich character, on the edges of wet parts.

The bark is used as a substitute for oak bark in tanning purposes. The quality of its timber is coarse, and is therefore only cut up into rough deals or planks, in which shape it is now being extensively used in the construction of the plank roads of America, owing to its being more durable than the wood of the pine in such situation.

We have not yet succeeded in growing this tree to respectable timber size in this country, although we have some very good specimens, such as those at Invermay in Perthshire, and Buchanan House in Dumbartonshire.

Sugar Maple (*Acer saccharinum*). *Introduced into Great Britain in* 1735.—I have found this tree from 80 to 100 feet high, and even upwards, with a diameter of from 30 to 40 inches at 4 feet from the bottom, on soils of deep, rich, vegetable mould, close to swamps, on flats, the banks of rivers, and in ravines. It is found in a healthy condition on different sites, on soils differing widely from each other, but all having a tendency to be deep, rich, and free from actual wetness. Where found on absolutely wet or dry soils, it was always small, and stunted in its growth.

This is a favourite tree in America, and no man will readily take a farm which has not part of its "bush" composed of this tree, as from its sap, in early spring, large quantities of excellent sugar are made. It is extensively used in the making of furniture, for which there is no kind of wood better adapted; it is also a favourite article of fuel. In the autumn, its decaying leaves give a gorgeous effect to the American forests.

American Chestnut (*Castanea vesca*). *Indigenous to our own country as well as America.*—I found growing on good, rich, loamy soil, and on sites similar to those occupied by the sweet chestnut of Europe.

Its wood is used. for fencing purposes in America, and for house building where it can be procured; but it is nowhere plentiful.

The Tall Birch (*Betula excelsa.*) *Introduced into Great Britain in* 1767.—This is a beautiful tree, and grows to large dimensions, on dry soil of a deep and rich character. On such soil, I have seen it about 90 feet in height, with a diameter of over 2 feet at the bottom. I have also found it on wet spots, and on poor land, but then only comparatively small.

Its timber is extensively used, and is admirably adapted for the purposes of the cabinet-maker.

The specimens of this tree found in Britain have not yet attained a very large size.

The Paper Birch (*Betula papyracea*). *Introduced into Great Britain in* 1750.—On dry and poor soils, such as on the slopes of ravines and banks, this tree grows well; there I have seen it about 50 feet in height, with a diameter of 15 inches at bottom. It does not succeed well on rich or wet soils.

Is used for the same purposes as the tall birch, and, like it, has attained to only trees of small size in Great Britain.

American Hornbeam (*Carpinus Americana*).

Introduced into this country in 1812.—Is found on all soils of a dry and poor character, and of a sandy nature, where it attains the height of 40 feet, with a stem of about 18 inches diameter at bottom.

In America the timber of this tree is used for furniture purposes.

American Beech (*Fagus ferruginea*). *Introduced into this country in* 1766.—Grows frequently to a height of 120 feet, with a stem of 4 feet in diameter at bottom; it never succeeds well where found on soils of a wet or strong character.

Resembles very much the beech of our own country, both as regards its nature and appliances; but it has not yet grown to any great size here.

Elder-leaved Ash (*Fraxinus sambucifolia*); *Walnut-leaved Ash* (*Fraxinus Juglandifolia*); *Downy Ash* (*Fraxinus pubescens*). *The sambucifolia was introduced into this country in* 1800, *the Juglandifolia in* 1783, *and the pubescens in* 1811.—When in a healthy condition, I have chiefly found them growing on rich and deep lands, with a moist and cold-bottomed subsoil. I have never met with these kinds on dry or poor soil.

The ash is rather a common tree over America, and is extensively used for railway purposes, and also for those of the turner, especially the wood of the walnut leaved, which is sometimes called the black ash. The toughness of this kind is remarkable, so much so that pillars can be turned out of the solid block, which [illegible]

[illegible] state along the banks of rivers and creeks, and never, that I have observed, is it to be found on poor or dry soils.

Its wood is admirably adapted for furniture making, and resembles very much that made from the other kinds of walnut trees.

Shell-barked Hickory (*Juglans alba*). *Introduced into Great Britain in* 1629.—I have never seen this tree on soils the least wet, but found it luxuriating on a soil of a dry and rich loamy character.

The timber of this is also used for furniture purposes.

The tree has not grown to any considerable size in Great Britain.

Bitter Nut Hickory (*Juglans amara*). *Introduced into this country in* 1800.—The natural conditions of soil and site in respect to this tree are similar to those of the shell-barked hickory.

Its wood is also used for making furniture.

Has only grown to the size of a small tree in this country.

Tulip Tree (*Liriodendron tulipifera*). *Introduced into this country in* 1663.—In warm situations, where the soil was deep and rich, I found this tree growing luxuriantly, and presenting a stem in height of about 70 feet, with a diameter of fully 20 inches.

It is only fitted to be an ornamental tree in this country, and cannot be said to be of any economic use, as its wood is too soft to be applied to anything permanently useful.

In some of our English parks, such as Longleat and Stoneheath, Wiltshire, where [illegible] are nicely sheltered from the winds, [illegible] specimens of this tree may be seen [illegible]ng very healthily, and of considerable [illegible] very beautiful tree, and deserves [illegible]anted than it is, both for sake [illegible] foliage.

[illegible] *American Larch* (*Larix* [illegible] *Introduced into Great Britain* [illegible] tree luxuriates in swampy [illegible] have seen a large [illegible] marshy ground wholly [illegible] abundant crop of this tree, [illegible] and was flat and cold-bottomed, [illegible] places covered with water. In ich places, although the greater part of the rop grows on parts which were covered by ater, still the trees growing in the skirts of he swamp were by far the finest specimens, ome of which, I observed, had attained the eight of fully 100 feet, with a stem of nearly feet at the bottom. The soil most suited to its healthy development is therefore one of a wet and cold nature. It is sometimes to be seen growing on dry banks, but never to any considerable size.

Its wood is of excellent quality, very durable, and exceedingly well adapted for railway ties, &c. Judging from the out-door purposes for which I have seen it used, and the number of years it had stood out, I think it is even more durable than the European larch. The tree has, however, not attained respectable dimensions in Great Britain; the largest I know of it is at Brahan Castle, in Ross-shire.

Weymouth Pine (*Pinus Strobus*). *Introduced into Great Britain in* 1705.—This is what, in Canada, is called the "White Pine," and is the chief economic tree of the country. Its timber is very valuable, being easily wrought, comparatively free from knots, and very durable; and is a species of wood of which Canada has an almost unimited supply. It is exported to Britain in the shape of masts, deals, laths, and squared timber.

Very fine specimens of this tree may be seen all over Canada, especially in the valley of the Ottawa. There I have seen specimens upwards of 200 feet in height, with a diameter of stem over 6 feet, about 6 feet from the ground. I have no doubt whatever that, if care was taken in planting it in this country, it would make a tree of no mean dimensions. Let us see, therefore, in what condition of soil it is found in its natural state. This I found to be of a deep sandy loam, resting on a gravelly bottom, perfectly dry. Where I found them on such a soil, they were the finest specimens, and the timber was of the finest quality. I have also seen them growing on flat parts of the country, where the soil was of a very rich character; but there, although the trees grew rapidly, and attained large dimensions, their wood soon decayed, and the trees seemed to die at a premature age.

When attention is paid to soil and situation, it seems to grow very well in this country. I have seen several specimens in Great Britain containing, I should say, fully 50 cubic feet of timber.

Red Pine of Canada (*Pinus resinosa*). *Introduced into this country in* 1756.—This is another tree the timber of which is valuable in an economic point of view, and is largely exported to this country. It is comparatively rare, except in the Ottawa district, where it abounds pretty plentifully. In Lower Canada, it is only found here and there on rocky, dry paths. It would succeed very well in this country if sites were chosen suitable for it, similar, as far as possible, to that in which it is found in its natural state. This I found to be on dry ridges, with poor gravelly soil. It is never found where there is the least approach to wetness, nor where the soil is at all of a rich character.

Balsam Poplar (*Populus balsamifera*). *Introduced into this country in* 1692.—I have found this tree always growing on a deep rich loam of a dry and light character.

Specimens of this tree are too plentiful all over this country to require any further remarks on it.

Small-leaved Trembling Poplar (*Populus trepida*). *Introduced into this country in* 1812.—Grows, in its healthiest condition, on dry and poor soil on banks and ridges. Its timber is of no commercial use, although the tree attains considerable size.

Large Tooth-leaved Poplar (*Populus grandidentata*).—The peculiarities of this tree are in all respects similar to those of the Populus tremula.

Necklace Bearing, or Black Italian Poplar (*Populus monilifera*). *Introduced into this country in* 1772.—No absolute rule can be laid down as to what kind of site it grows healthiest on, only that it seems to prefer deep rich lands, with a medium betwixt wet and dry. I found this tree plentiful on the borders of Lake

Ontario, where the land is of a deep and rich character. It is the most valuable of all the poplars, and is too well known to require comment. It has attained very large dimensions in Britain, and is now becoming a very valuable tree.

Ontario Poplar (*Populus macrophylla*). *Heart-leaved Poplar* (*Populus candicans*). *The macrophylla was introduced into this country in* 1820, *and the candicans in* 1772. —I have found both these on the valley of the Ottawa, but neither of them seem to attain important dimensions of timber. The specimens I saw grew on dry sloping banks, but were small trees only.

Blunt-lobed-leaved Oak (*Quercus obtusiloba*). *Introduced into Great Britain in* 1786.—I found this tree to grow best on a dry light sandy loam, on the banks of rivers. Its wood is of good quality, and is used in America for every domestic purpose. From the trials which it has had in this country, it seems to be adapted to grow in our climate. We have fair average specimens of it all over Britain; and besides its qualities as a useful tree, it is also a very ornamental one.

White American Oak (*Quercus alba*). *Introduced into Great Britain in* 1724.—This is doubtless one of the best of the oaks, and is of very large dimensions along the more fertile districts of Canada. Its favourite site is on the flat lands by the sides of rivers and water-courses, where the soil is deep, strong, and inclined to be somewhat cold-bottomed. It is also to be found growing on poor and dry soils, but on such it never attains large dimensions. The quality of its timber is perhaps only second to that of British oak; and it is this oak tree which forms the great standard of our importations of oak from America. It has attained a size of fully 60 feet in height in this country, and bids fair to become one of our standard oak trees. It is also a very ornamental tree.

There are a great many oaks which have been introduced into this country from America; but I have only taken up the two principal ones, as they are likely to supersede all the others in an economical point of view.

The Arborvitæ (*Thuja occidentalis*). *Introduced into Great Britain in* 1596. — In America it is commonly called the "White Cedar." To those who have not seen this tree in its native grandeur, the name implies a mere bush, fit only for growing in our gardens and shrubberies. I believe, therefore, that many will not credit me when I say that I have seen them about 100 feet in height, with a stem of between 4 and 5 feet in diameter at the bottom, with beautifully spreading branches. It is a very graceful tree, and deserves particular note. Perhaps it may be asked, why has it not grown to such a height and general dimensions in this country? The reason that the tree has not attained more than the dimensions of a bush here, is simply that its *wants in regard to soil and situation* were not understood when planted. Let us see how it is in this respect as found in its native state. I found it invariably luxuriating in the *wettest* parts of the country; in swamps, creeks, and on the flat and wet banks of rivers, sometimes wholly occupying these. Now, how do we find it planted in this country? Almost invariably on dry and exposed places, where of course it never can succeed. Indeed it is a wonder that they grow at all as they are treated in this country. It would not do, however, to plant them actually in the midst of water here, as it would then be too cold for them, and they would most probably die altogether. Our climate is not warm enough to grow them on land saturated with water. The site which I think most suitable for them in this country is on low-lying flat parts, well sheltered, and within the influence of water, but not absolutely in it, although in its vicinity.

The timber of this tree is extensively used for fencing purposes in America. It is light and durable, and I think might be judiciously used in this way in this country.

I have seen very fair specimens of it in England, where they had been planted in suitable situations.

American Lime Tree (*Tilia americana*). *Introduced into Great Britain in* 1752.—Grows

dimensions on soils of a dry, rich,
p character.

me cases this tree has made fair
progress in this country.

American Elm (*Ulmus americana*).
ed into Great Britain in 1752.—This
tree, and grows to a very large size
American woods. When in its
st state, and where it has obtained
st dimensions, I found it growing on
, with a soil deep and rich in vege-
atter, and seemingly with a wet sub-
n such places I have seen them 100
eight, with a diameter of 4 feet at the
of the stem. I have never seen them
to any great size on dry soils, or on
roughly wet.

s only as yet attained the size of a
ee in this country.

of Gilead Fir (*Picea balsamea*). *Intro-*
to Great Britain in 1696.—This tree
growing on lands of rather a cold-
d character, on flats by the sides of
I have seen it fully 60 feet in height,
tem of about 2 feet in diameter.

mber is used in the shape of deals in
It has not succeeded very well in
ntry.

ng, in the foregoing, referred to the
l kinds of timber trees which I found
; on the eastern portions of North
, I now come to make a few re-
s to how they should be dealt with in
ritain, in order to their better success
ountry in future.

to be inferred from my remarks, in
to the different kinds, that compara
w of the American trees have as yet
l respectable timber size in Great
that this is attributable chiefly to
f attention to condition of soil and
n, so as to adapt these, as nearly as
, to those in which the trees are
n their natural state; and that, if more
n had been paid to the peculiarities
kind when planting them, our success
cultivation would have been greater
a more decided character. For
e, why is it that in this country the American arborvitæ, generally speaking, only attains the size of a very small tree or large bush? The answer is, simply because the tree in its natural state grows in deep, rich, and naturally wet lands, with perfect shelter all around; while in Britain, these conditions are generally reversed, as we find it generally planted in poor, thin, and naturally dry lands, and frequently on exposed sites. This explains the cause of our want of success in the cultivation of the arborvitæ; and the same remarks may be said to apply in degree to our mode of cultivating all the other kinds. The great promoter of the growth to perfection of all the American trees named, is shelter. This is indispensable to success in their cultivation, whether here or in their own localities. I have often remarked, while on my tour in America, that wherever a tree, or it might be a few trees, stood alone in a large open clearing or field, where they were exposed to storm, they were invariably of a short-stemmed, branchy-topped, and somewhat stunted character, very similar to the same kinds when planted out under similar circumstances in our own country; thus proving that the American trees, even in their own native habitats, do not attain large dimensions when growing on exposed sites.

All the kinds named in this paper attain their greatest dimensions when grown on soils and sites such as have been described in reference to each respectively, and when perfectly sheltered from winds by masses of other trees all around.

Now this state of things can be secured here as well as in America; for in the central parts of a large wood in Britain there is as much shelter obtained as in one of equal extent in America.

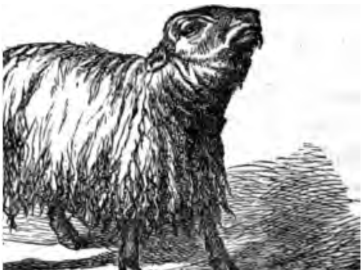
In order to ensure better success in future, in regard to the cultivation of the kinds of American trees named and referred to in this paper, we have only to plant them in soils and sites similar to those in which they are found naturally, and to secure shelter and warmth to them by planting them in large masses, either among themselves, or with other kinds. Our climate is no drawback to the healthy development of the trees found on the parts of North America referred to, as the success of several of them prove. For example, we may refer to the poplars. In this country, the American kinds of these attain equally as large dimensions as they do in their native habitats. Now, what is the cause of this? It is that we have given the poplar the soil and site congenial to it; that is, have we planted them in deep, heavy, cold-bottomed lands, and in sheltered sites, since they have done well with us? If we had planted them on dry poor land, they would not have succeeded. Hence, in conclusion under this head, if each kind be attended to accordingly, it cannot fail to succeed equally well.

The Veterinarian.

RABIES—HYDROPHOBIA.

S, or madness, like many other
eases in which the nervous system
, possesses most occult characters;
gh the pathognomic signs are vio-
ightful, *post mortem* examinations
light upon its real nature. Ob-
under other conditions have fur-
iable data. The most prominent
its acknowledged contagious pro-
communicability, by inoculation,
d other animals. When it appears
tribe, or sheep, or pigs, it may be
ed to inoculation from the bite of
dog.

nptoms of rabies will be rendered
rent by the records of a number of
came under the personal observa-
writer about three years ago.



ymptoms of Rabies in Sheep.

dog had been taken by a groom
f the affection, and secured to the
anger in a building where a num-
lves and sheep were confined.
e night he broke loose, and re-
it some of the animals.

ves and two sheep were bitten on
the month; one of the calves sus-
ompound fracture of the fore-leg,
destroyed; the remaining three
two sheep were kept for observation. On the 23d of the month, one animal (a calf) exhibited an inordinate desire for water, but experienced a difficulty in swallowing. The appetite and rumination were suspended, and diarrhœa quickly ensued from nervous excitement. Saliva flowed profusely from the mouth, and the animal regarded the movements of a stick or piece of paper, held towards or away from it, with the most intense watchfulness, and after a time would rush violently at it.

On the 25th, a second calf became affected, and about the same time one of the sheep (a ewe); in a few more days the third calf and the second sheep (a ram).

The first exhibited the most perfect quietude when any one stood near; but, when left alone, continued to bellow furiously, and, as far as the chain would allow, mount the manger, or stall partition, or sometimes jump with all feet at once from the ground to a considerable height in a perpendicular direction, would fall helplessly to the ground, and would only be able to rise with difficulty. The second and third animals were very vicious, kicking and running at all persons who approached, and bellowing continually.

The sheep were passive, being generally found with the head elevated and held to one side, as represented in the woodcut; one ear, and the eye-lid of the same side drooping, the latter being nearly closed. At any sudden movement or noise, the animal would drop awkwardly, and rise with difficulty. There were no signs of vice, diarrhœa, or salivation in these animals. The ewe gave birth to two fine lambs about one week before the attack, who shewed no signs of having inherited the malady.

It is to be particularly remarked that the wounds inflicted by the rabid dog had, in every case, healed up; but, contemporaneous with the appearance of signs of rabies, there arose an intolerable itching or irritation in the parts.

The calves were both destroyed on the 27th, having lost flesh very rapidly. The ewe died during the night, and the ram the following day. The first calf affected was sinking fast, but probably would have lived thirty-six hours longer. The appearances which were presented on *post mortem* examination, are as follows:—Calf No. 1., Posterior part of tongue, fauces, and pharynx, swollen, and of purple colour. Vocal cords congested, swollen, and ulcerated; lower part of trachea and bronchial tubes filled with tenacious frothy mucus. Numerous spots of ecchymosis on the surface of fat upon the heart; right auricle and ventricle filled with dark coaguated blood; left auricle also contained the same kind of blood, but the left ventricle was nearly empty. No ecchymosis upon the organ itself. Endocardium and substance of the heart rather pale. Costal pleura slightly congested, peritoneum healthy, but no fat in the folds; stomach and intestines generally pale; *vena porta* empty; abomasum about half full—contents semi-solid. Mucus membrane healthy. Omascum contained a small quantity of rather soft food between the leaves, which were pale, epithelium peeling off; reticulum, or second compartment, healthy, and contained a quantity of dry matter mixed with sand, the latter also blocking up the cells of the organ; gall-bladder nearly empty; bile pale in colour.

The carcases of calves Nos. 2 and 3, exhibited in all respects similar conditions. As the pole-axe had been used, the brain could not be examined.

Examination of the ewe shortly after death.—A large collection of gas was found beneath he skin over the surface of the body. Mouth and fauces healthy; pharynx and larynx slightly congested; trachea and bronchial tubes healthy; heart soft and friable, and contained small clots of coagulated blood; peritoneum healthy; spleen disorganized, and not unlike a mass of jelly; abomasum healthy and quite empty; omasum contained a small quantity of soft light-coloured matter; reticulum healthy and empty; rumen moderately filled with rather dry matter; ordinary food; intestines pale; small ones filled with gas.

The Brain.—*Dura mater* perfectly healthy; surface of cerebellum congested, internally pale and soft; in the depth of the convolutions of the cerebrum, were also streaks of congestion, *corpus striati*, and *chordid plexus* congested, and the fluid of each lateral ventricle more abundant than usual. At the base of the brain the congestion is particularly well marked.

In the ram, the brain was much more congested, and the membranes contained a considerable quantity of effused fluid. The fourth stomach also contained hemorrhagic spots (ecchymosis). In other respects, no difference was observed.

The symptoms here described exhibit the two forms of the disease, those seen in the calves being denominated the *active* or *acute* form; while those exhibited by the sheep were *dumb*, or *sub-acute* form. In dogs, the acute variety is known as *barking* rabies, from the dismal howling made by the creature.

From the fatal nature of the malady, all rabid animals should be segregated and destroyed as soon as possible, and no attempt to treat them should be made, as while they live, no one can tell how far, or to whom, the contagious virus may be conveyed. And we may here incidentally state, for the information of many misinformed in such matters, that the supposed belief in the ultimate and inevitable madness of persons bitten by dogs in health, but which afterwards "go mad," is without any foundation whatever.—*Clater's Every Man his own Cattle Doctor.*

The Dairy and Poultry-Yard.

PURE BREEDS.

dom occurs that topics of farm busiss afford a subject for conversation he general public; yet this year the prices realized for thorough-bred ıve been continually remarked, even e who know scarcely anything of 1500 guineas for a six-year-old cow, ›o guineas for a pair of two-year-old may well cause surprise. These ›re actually paid, and with no *luck*-›r pure shorthorns bred by Mr Booth ptain Gunter. At the Oxford and re Shows, other high sums were paid ›st prize yearling heifer sold for 500 and the second prize for 350 guineas. ıeas each were paid for Leicester ›. Cotswolds commanded similar nd even pigs sold as high as 35 each! But these prices, high as ›m, fall into the shade when 5800 is paid for the thorough-bred horse ›ur. It may be asked how such ›ome about? Is there a scarcity of or is the axiom of "fools and their found to be truer as it grows older? ity of animals of certain pedigrees ıdoubtedly is, hence the rise in the for animals of pure Bates and Booth but there is not such a scarcity of h-bred stock. The slaughter of concattle may have caused an increased r graziers, and thus tempted farmers d more than to buy in and graze. er, our agriculturists are every day ıg more enlightened as to the profits ›ved stock, and selection in breeding e lower animals. Every huntsman the value of propagating certain ; of scent and endurance in the Of how much more value than is it to the farmer to breed animals whose very management alone tends to benefit his business? In keeping stock, well-bred cattle get done a little better than common things; it is a well-known fact that animals fed well when young never lose their calf flesh. The better keeping leaves a richer and larger quantity of manure, which, in its turn, produces better crops of grain and roots. Many men in our own district have long since known the benefit of this. The late Earl Ducie was one of the first to make it apparent to an eye-witness, and the Royal Agricultural College still demonstrates it. But, argues the doubter, who can compete with a lord in buying pedigree stock at such prices?—it don't pay. The late Mr William Hewer, at Sevenhampton, for thirty years proved that well-bred stock would pay. He bought large-framed pedigree cows, shewing dairy properties, and put them to the best bull he could purchase. In this way he produced a class of cattle that would give their 25 quarts of milk a-day, and when dry, feed in a short time to upwards of 150 stone. The same way with his stock of Berkshire pigs, by judiciously selecting and feeding them well when young, he brought out swine that won the first prizes at the Royal shows for years in succession.

We have seen the dispersion of two stocks such as our district has rarely seen brought out by tenant-farmers; indeed, we believe we are right in saying that two such stocks did not exist in our neighbourhood, or in any of the southern counties. Mr W. Butler's herd of cattle was sold at Badminton, on Wednesday the 5th of October, and on the following day the late Mr Hewer's herd came to the hammer at Sevenhampton. The un timely death of "Tom Butler," Mr Butler's eldest son, a young man of great promise, has led to the sale of the Badminton herd, and death also accounts for the Sevenhampton sale. We had lately an opportunity of inspecting both stocks. At Badminton, we found a number of cows in excellent condition and in calf, grazing on the short bite that has been freshened by the late rains. Old Darlington 1st, bred by Mr Sainsbury, at Corsham, is a grand specimen of bovine creation; fresh-looking at fourteen years' old, with a docile expression of countenance: a rich quality of flesh and abundant hair, she is the type of a fattening beast, as the cushions on her rumps testify. There were many of her descendants put apart for us to see, all of one character, long straight backs and quarters, with wide loins, round ribs, and the same docile, but rather masculine-looking, heads. Darlington 17th, a yearling, with a pure Bates's pedigree, was a picture; with a coat of long hair, beautifully variegated white and roan. The Minnies seemed to be the next best lot, all of the same roan colour, and full of heavy flesh. Some of the Lavenders looked rather small in comparison with the rest. The calves were nearly all of the same hue, and very fat, being reared on skim-milk made warm with water in which linseed had been boiled. Count Bickerstaffe 2d, the bull, was level and true made; short legs. The bull calves had not thriven so well, but were of much promise.

Ten miles through a fine country brought us to Chippenham; and twenty minutes in the train to Swindon station; in another half hour, behind a smart cob, we were in the pretty village of Sevenhampton, with the brook running in front of Mr Hewer's house. The cows have been badly off for keep, but we saw large-framed cows with great udders and a quality of mellow flesh, soft to the hand, and so flexible, indicative of the highest feeding properties. Two or three of the cows, dry, were specimens more of Smithfield Club Show than poor Wiltshire pastures, but eye proof of the great inclination to feed shewn by the cattle. The two-years' old were good looking, and in calf to a very smart, heavy-fleshed Booth bull, Bothwell. The yearlings, in lower condition, were on an exposed part of the farm, and somewhat short of keep, but the calves were very excellent, especially the bulls. The pigs appeared not so fat as we expected to see them, but they had the fine snouts, long broad bodies, and white marks of the true breed. We are told that, for years past at both places, they had always plenty of demand from dairymen for the best bulls, the inferior calves being steered, and the yearlings often averaged over 30 guineas. Here, then, were two stocks, a credit to tenant-farmers and the district in which they live. The English nation always looks to its roast-beef, and our increasing population must be fed. It is to these improved stocks we must look for our food. Bony foreigners from the Continent may suit the lower classes, and cattle plague will keep even many of these away. Americans, with their large populated cities, know full well our stock, and it is they and the Canadians who give us the high prices for our best bred animals. Let the English farmer look to himself: the public must be fed, and will have the best quality of meat. We earnestly hope that our own countrymen will, stimulated by what has been done by Mr Butler and the late Mr Hewer, endeavour to go and do likewise.

RED CLOVER INIMICAL TO BUTTER AND CHEESE.

THIS is the opinion of Mr L. B. Arnold, who has a cheese factory in Tompkins County. He gives, in the *Albany Cultivator*, a description of the increase in the progress of butter and cheese making in that county. Ten years ago, he says, there were only 100,082 lb. of cheese manufactured in Tompkins County, and that was of very poor quality. Butter making engaged the attention and absorbed all the skill of the cow-feeders in the county. Of this commodity, 1,849,145 lb. were annually made. Things have changed very much within the decade. "Eight factories and creameries are in successful operation," their power of manufacture being equal to the milkings of 4200 cows. About 1,000,000 lb. of cheese are now manufactured, or at the rate of 100 per cent. per year increase in the ten. This is at the factories alone; but private dairies swell the total up to about 250,000 lb. more. The quality of the cheese has greatly improved; indeed, it approaches in excellence to that of the old and best dairy districts, and would equal it—the character of the soil, and the experience and skill of the cheese manufacturers, being quite as good—but for the pastures. "It requires old pastures," says Mr Arnold, "to make the best butter and cheese." What follows with regard to red clover, we give in his own words:—

The pastures in Tompkins County have been recently laid down, and, what is more unfortunate for her dairy interest, a large share of them have been stocked down with red clover, not to mention the foul weeds that abound in many of them. The milk from such pastures cannot produce the best butter or cheese. The cheese, in particular, from these clover pastures, has a strong flavour that operates unfavourably for its reputation with experts and cheese fanciers. I have found, by testing and comparing, that the milk from these clover pastures is poorer in quality and different in composition from other milk. While it produces less cheese from a given quantity than other milk, the cheesy matter it contains is in greater proportion than its butter, and, as a consequence, it is heavier than common milk, shewing, by the lactometer, from 102 to 104 deg., common milk being 100; while, in the cream gauge, it shews less than the usual quantity of cream. In a test made the 1st day of July of the milk brought by each patron of my factory, the cream was found to vary from six to ten per cent.; the former was from red clover, and the latter from a pasture of Timothy and June grass. A sample of all, when mixed, shewed seven and a-half per cent. cream, whereas the usual average of cream at that date is ten per cent. All the milk in the county is not so poor as this, but wherever much red clover abounds, it falls below the proper standard of richness.

Where good clean pastures and fresh water are furnished, as good butter and cheese can be made, and as profitably, as in other parts of the State. At the creamery of Mr Speed, in the south-east part of the county, the net returns to the patrons for milk delivered to the factory last year, varied but little from two cents. per lb. I doubt whether many factories in the State have done better.

Alsike clover is finding some favour in this county as a substitute for red. On moist and loamy soils it makes a large growth that is much relished by cattle, and, when mown, makes excellent fodder. On the drier soils its growth is diminutive. When pastured, it makes richer milk and better butter and cheese than red clover, but is inferior when compared with Timothy and June grass.

CHANGES IN THE COLOUR OF POULTRY.

IT appears to me that the birds originally possessing the darkest shades of colouring in their general featherings, are more susceptible of these pantomimic changes than those of lighter plumage—Spanish fowls, for instance, in particular. In 1851, I, by accident, secured some really unexceptionable Spanish chickens. They were, at that time, difficult to obtain at any price, for to see purely white-faced birds was then rather the exception than the rule of the Spanish classes at our numerous poultry exhibitions. They were placed upon a most excellent "run," a farm of 300 acres, used as a feeding-farm for fattening cattle for the butcher. It was certain no fowls could by possibility have better chances of well-doing, for the fold-yard was not only an exceedingly extensive one, but also well stored with excellent food, provided for these beasts that were housed and stall-fed. To such the poultry had at all times unrestricted access, besides being freely tolerated on any part of the grounds they chose to frequent, whilst the enticement of a plantation that stood near the house were not neglected. All the parent fowls thrived well, and bred abundantly. I must now draw attention to the cock. His colour was at the outset perfect, and his legs as deep and slaty as the most fastidious could desire. At the end of the second year the news reached me that "the old cock was moulting up his [illegible] prised at se [illegible]

[illegible] the lack of colour was attributable to such cause; whilst I strongly suspected, after a natural moult, all would be right again. Nothing could be more deceptive than this conviction; for, the September following, not only did all the new feathers as renewed prove positively white, but the legs, feet, and the bill likewise matched to a tittle. He stood before me a perfect albino, in the place of my black Spanish bird. The iris of his eyes also became considerably lighter, but the face still maintained the same purely white character that had always rendered him my especial favourite. But the most extraordinary part of this fowl's history is contained in the present paragraph. During the time he was white his chickens proved black as any, and, yet more strangely, the cock itself eventually resumed his original colour, and has since then moulted out truly, to the equal astonishment of myself, and the party who purchased him when a white one. The above was undoubtedly the most extreme freak in poultry that I ever met with. Several Spanish fowls have, to my knowledge, assumed a pied character, and one or two others a white plumage; but in each of these latter instances there was not any restoration of colour afterwards, even in the slightest degree. A lady, who frequently exhibited some of the best Spanish fowls of that day, had an adult [illegible] was of extraordinary excellence, [illegible] which many other judges, [illegible] as myself, had given numbers of first [illegible] do I recollect an instance of it [illegible] the third or fourth [illegible] ectly "brassy-winged" [illegible] well-known breed of [illegible] that name. It still bred [illegible] but itself continued to [illegible] onable feather, and, of [illegible] exhibited. Mr Bromley, [illegible] grey dorkings were no- [illegible] bition successes, affords, [illegible] hens, another ample. She was at the outside an extremely dark grey, and what is termed "robin reasted." She became (little by little) very early white; her chickens, however, are variably true to her original feather; and he still remains one of the most unexceptionable dorkings for general character, size, nd conformation I ever yet met with. I ould instance another as unexpected a hange that occurred some years since to a ird of a friend of mine, who kept English nd foreign pheasants in an aviary. A hinese silver pheasant hen, of four years of ge, without any premonitory symptom, at a ingle moult became altogether white, and othing save the actual presence of the range contrariety of colour betokened her any way affected, for her health was unimpaired, and her brood the year following did not betray any change in their descent. This bird's eyes changed from a very deep hazel to a perfectly bright red. I heard, from the dealer who eventually purchased her, that she yet maintains inviolate the unsullied purity of plumage she so capriciously assumed.

As it may tend to re-assure the confidence of those poultry amateurs who may meet with individual cases within the limits of their own poultry-yard, I would draw attention to the fact that, in every case that has ever yet come within my knowledge, the bird still bred as before, and that the progeny were apparently quite unaffected by the singularities of their predecessor.—*E. Hewitt*, *Birmingham.*

POULTRY KEEPING ON A LARGE SCALE.

ONLY hope of success in rearing a large number of poultry in one locality is in ving them a widely extended range. The perience of Mr Warren Leland, of the etropolitan Hotel, New York, so closely rresponds with our own (says *The Field*), at we have much pleasure in quoting the marks made by him at a late meeting of the ew York Farmers' Club. He says:—

"I have found that, for every hundred fowls, u must give up at least an acre. But ugh land is as good as any. Hens naturally ve the bush, and I lop young trees, but ave a shred by which they live a year or ore. These form hiding-places and retreats r them. In such places they prefer to lay. have great success, and it depends on three four rules, by observing which I believe one n make a good living by hens and turkeys.

"1. I give my fowls great range. Eighteen res belong to them exclusively. Then the oods have the range of another big lot, and e turkeys go half-a-mile or more from e house. The 18 acres of poultry-yard is ugh land, of little use for tillage. It has pond in it, and many rocks, and bushes, and weeds, and sandy places, and ash heaps, and lime and bones, and grass, and a place which I plough up to give them worms.

"2. When a hen has set, I take her box, throw out the straw and earth, let it be out in the sun and rain a few days, and give it a good coat of white-wash on both sides. In winter, when it is very cold, I have an old stove in the house, and keep the warmth above freezing. There is also an open fire-place, where I build a fire in cool wet days. They dry themselves, and when the fire goes out, there is a bed of ashes for them to wallow in. Summer and winter my hens have all the lime, ashes, and sand they want.

"3. Another reason why I have such luck is, because my poultry-yards receive all the scraps from the hotel. Egg-making is no easy work, and hens will not do much of it without high feed. They need just what a man who works requires—wheat bread and meat. As to breeds, I prefer the Brahmas, light and dark. I change the cock birds every spring, and a man on the farm has no other duty than to take care of my poultry. I have often 3000 spring chickens."

The Apiarian.

HOW TO SECURE WORKER COMB.

As the days for using box-hives and letting bees alone have nearly passed away, and we have the moveable frame hive with all its advantages, we should put forth our best endeavours to use such advantages to our profit. To have the hive filled with all worker comb, will be seen at once to be one thing which will tend to make bee-keeping profitable. Drones are merely consumers. They do not assist in gathering either honey or pollen, or in any labours of the hive, unless it is to keep up the necessary temperature for comb-building, breeding, &c. They are reared at the commencement of the swarming season, for the purpose of fertilizing the young queens. Now, if you have the hive half-filled with drone comb, as is often the case in box-hives, half of all the bees that hatch at certain seasons of the year will be drones, ready to consume what you would otherwise get as surplus. A neighbour of mine, who has been persuaded to use the moveable frame hive, yet keeps bees in the old style—that is, hiving them and then letting them alone—called me in to see his bees. He said they were not doing well [illegible] opened [illegible] and found [illegible] ud t[illegible] [illegible] to two-thirds of the room in the hive, ac ing to the size of the swarm.

As their first want is worker bees, will build worker comb in all cas the queen is usually prolific. When have the frames which you gave them a half-full or so, take an empty frame o and insert them in the centre of the cl moving your division board and two or frames outward. In from five to eight according as they are gathering honey them two more, always inserting them centre of the cluster. In this way I u get all but two frames worker comb, ar quently the whole, unless it is a little comb at the bottom. This I cut out spring, and put in worker comb. But they attempt to build drone comb, ta the frame you put in, move the oth gether, and wait till the young queen laying in the old hive, and then take that to fill the hive. Insert a division if necessary, and give them one fram time, and they will build worker comb the young queen is invariably. I usu each hive have two or three square in drone comb, as they do not seem to b ented without any. If you should [illegible] way a frame where the old qu [illegible] bees attempt to fill it with [illegible] the frames together and [illegible] Then, by-and-by, y [illegible] frame from where the [illegible] The reader will ren [illegible] lone near the sw [illegible] n the season, the te [illegible] o build drone com

[illegible] in the *Apiculturist*.

The Naturalist.

LOCUSTS.

FROM M. Louis Figuier's interesting "Insect World," we extract the following regarding these devouring insects with which fortunately in this country we are not so much troubled. For the woodcuts of one of the most destructive species of these pests, and the effect of their appearance in Algeria, we are indebted to the kindness of Messrs Cassell, Petter, & Galpin:—

Locusts are very abundant in many parts of the world. In northern countries, where they multiply less rapidly, their ravages are less disastrous, though still very considerable. But in the southern portions of the globe they are a perfect pest — the eighth plague of Egypt. Certain species multiply in such a prodigious manner, that they lay waste vast spaces of land, and in a very short time reduce whole countries to the very last state of misery. These insects inflate themselves with air, and undertake journeys during which they travel more than six leagues a-day, laying waste all vegetation on their road.

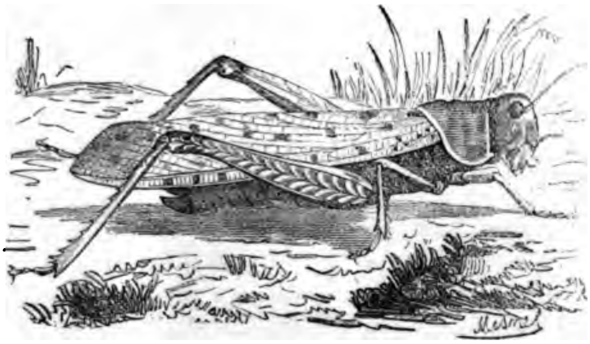


Fig. 1.—Locust (*Acridium* (*Œdipoda*) *migratoriam*).

The most destructive species is the Migratory Locust (*Acridium* or *Œdipoda migratoria*, fig. 1), which is very common in Africa, India, and throughout the whole of the East. Isolated specimens of this insect are to be found in the meadows round about Paris, especially towards the end of the summer, and, very rarely, in England. This species is greenish, with transparent elytra of a dirty grey, whitish wings, and pink legs. A second species, the Italian locust, also does a great deal of damage in the south All the species undergo five moults, which take six weeks each. The last takes place at the end of the hot weather, towards the autumn.

It is especially in warm climates that they become such fearful pests to agriculture. Where-ever they alight, they change the most fertile country into an arid desert. They are seen coming in innumerable bands, which, from afar, have the appearance of stormy clouds, even hiding the sun. As far and as wide as the eye can reach, the sky is black, and the soil is inundated with them. The noise of these millions of wings may be compared to the sound of a cataract. When this fearful army alights upon the ground, the branches of the trees break, and in a few hours, and over an extent of many leagues, all vegetation has disappeared, the wheat is gnawed to its very roots, the trees are stripped of their leaves. Everything has been destroyed, gnawed down, and devoured. When nothing more is left, the terrible host rises, as if in obedience to some given signal, and takes its departure, leaving behind it despair and famine. It goes to look for fresh food—seeking whom, or rather, what it may devour!

During the year succeeding that in which a country has been devastated by showers of locusts, damage from these insects is the less to [illegible]

comes the cause of a greater evil. numerable carcases, lying in heaps by the sun, are not long in entering [illegible] putrefaction, epidemic disease, c [illegible] poisonous gases emanating from [illegible] break out, and decimate the populati

are bred in the deserts of Arabia and , and the east winds carry them into nd Europe.

sts are always to be found in Algeria, in vinces of Oran, Bona, Algiers, and Bougia, y never commit those terrible ravages hange cultivated countries into deserts. re in Algeria years of locusts, as there are years of cockroaches, of blight, of cater- &c. These plagues are fortunately rare. st terrible took place in 1845 and in 1866. former year a formidable invasion of took place. It lasted five months, from to July, each day bringing new bands of evastating insects : and M. Henry Ber- then in Algeria, saw a column of them, passage began before daylight, and had y ended at four o'clock in the afternoon. yon, doctor to the army, and correspon- the Institute, addressed to this learned n account of a few peculiarities of this n, of which he was a witness. He speaks nd which passed on the 16th of March plain of Sebdon, going in the direction lesert of Angard. Their passage lasted urs. The locusts, having found nothing ur in the desert, came back again, and y made a descent upon the plain of Sebdon, 30 kilometres long, by 12 to 15 kilometres In four hours all the crops were devoured, vegetation destroyed. "The locusts," doctor, "left behind them an infectious of putrid herbs, produced by their ex- ."

lgiers, in the Faubourg Bab-Azoum, they ted in masses into the barley stores, and as the greatest difficulty in driving them reat barricades being raised before the oms to stop the invasion. In 1845 they ted into the pits in which the natives pre- eir wheat. According to the report of nmandant de la place of Philippeville, aillant, a column of locusts alighted in try round about that town on the 18th h 1845, which extended from 30 to 40 tres, and were found heaped upon the to the height of more than three res.

environs of Algiers alone were destroyed, 369 quintals of locusts. It is computed r hundred locusts go to a kilogramme. ves, then, a total of 14,760,000 insects d. As in this number half were proba- les, and as each female lays on an aver- nty eggs, the result we arrive at is, that pped the production of 516,600,000 larvæ on the territory of Algiers alone. The invasion of locusts which took place in 1866 was as disastrous as that of 1845. It was in the month of April 1866 that the vanguard of these destructive insects appeared. Debouching through the mountain gorges and through the valleys, into the fertile plains near the coast, they alighted first on the plain of Mitidja and on the Sahel of Algiers. Their mass, at certain points, intercepted the light of the sun, and resembled those whirlwinds of snow which, during the storms of winter, hide the nearest objects from our view. Very soon the cabbages, the oats, the barley, the late wheat, and the market gardeners' plants were partly destroyed. In some places the locusts penetrated into the interiors of the houses.

It was impossible to prevent the fecundation of these insects. The eggs quickly producing innumerable larvæ, the first swarms were very soon not only replaced, but multiplied a hundred-fold by a new generation. The young locusts are particularly formidable on account of their voracity. These hungry masses threw themselves upon everything which was left by those who went before them. They choked up the springs, the canals, and the brooks; and it was not without a great deal of trouble that the waters were cleared of these causes of infection, Almost at the same time the provinces of Oran and of Constantine were invaded. At Tlemcen, where, within the memory of man, locusts had never appeared, the ground was covered with them. At Sidi-bel-Abbes, at Sidi-Brahim, at Mostaganem, they attacked the tobacco, the vines, the fig-trees, and even the olive-trees, in spite of the bitterness of their foliage. At Relizane and at L'Habra they attacked the cotton-fields. The road, 80 kilometres long, which connects Mostaganem with Mascara, was covered to the whole of its extent.

In the province of Constantine, the locusts appeared almost simultaneously, from the Sahara to the sea, and from Bougia to La Calle. At Batna, at Setif, at Constantine, at Guelma, at Bona, at Philippeville, at Djidjelly, the inhabitants struggled with energy against this invasion, but neither fire nor any obstacles opposed to the advance of this winged army were able to stop their ravages. The French Government, to alleviate as much as possible the ruin which was thus brought upon the colony, opened a public subscription at the end of the year 1866.

The negroes of Soudan endeavour to frighten the locusts in their flight by savage yells (see fig. 2, page 380).

The Country Gentlewoman.

MY VERANDAH.

HOW I GARNISHED IT WITH CLIMBERS AND OTHER PLANTS.

BLESSED be the man who invented verandahs, and happy the woman who has enough of them to garnish with climbing plants and fringe with hanging baskets. Let me tell you about mine! The southern verandah leads to our dining-room, and shades the east window of the library. The end toward the sunrise is covered in summer time by a rustic trellis, decorated by what I call my "morning glories;" they grow out of a loose, rich soil, and are as beautiful on a sunny morning as anything you need wish. Among them is a climber resembling the Trumpet honeysuckle in foliage; flowers smaller and coral red. I received the seeds from a friend, and value it highly, as it remains in bloom very long, but I don't know its name. The common honeysuckle and clematis are trained around this porch, making a cool, shady retreat, dear to the hearts of the children. Two baskets are suspended in the shade; one overflows with a luxuriant growth of palmated ivy; and just here let me explain about these baskets. Ours are of galvanized wire; one is round, the other oval. A layer of moss next the basket serves the double purpose of retaining moisture and the earth. The larger of these has ferns by way of leafage—Aspidium Thelypteris is the very best, its fronds are so finely cut—and in the autumn a scarlet lily flames out from the greenness.

On the western and front side of our house is a long verandah, where the woodbine asserts its beauty in language too powerful for opposition. A wire basket here has "hens and chickens" peeping through moss for its undergrowth. Above is a strawberry geranium. Another has stone crop and coleus, and a bit of the "dusty miller;" another a Thunbergia—a flower very little known, for some reason or other, but which is quite a favourite of mine, from its clean, symmetrical growth and the delicate colour of its flowers.

Beneath one of the parlour windows is a tray 2 feet long, which has a Cobœa scandens starting from each end, framing the window with its leaves. A striped-leaved aloe stands between the two, and a scarlet verbena fills the rest of the space, save where a fringe of grass, a fine sort found in the woods (Poa nemoralis), runs round the edge and conceals the ravages of time—for it was once my butler's tray, dear matrons, now transformed into "a thing of beauty," and consequently "a joy for ever." This reminds me of a defunct chopping bowl, which, with a piece of wood over the worn-out bottom and painted a dull brown, bears every summer a sweet burden of geraniums and cerastiums; it has for a standard 3 feet of a tree trunk, cut out to thin our shrubbery. Next summer I mean to have an ivy stand on this verandah, built of the very crookedest roots I can find. We have another porch on the north side, and here cocoa-nut shells are doomed to petunias and sweet peas.

You will see from what I have written that I don't favour *mixtures*. I like better to fill a basket with one variety, or with two or three that are of congenial habits, and then take good care of them. Plenty of moisture is the main thing, given at proper times. Moss retains it. My ivy basket has flourished this winter with a thorough wetting on Monday, which it gets by standing a few minutes in a wash-tub of water, and an occasional sprinkling of the leaves through the week. A large sea shell is overflowing with Kenilworth ivy. Canary creeper (Tropæolum riense) grows well in baskets, and also small, single petunia and the Maurandia the two latter can be trained in pots simple trellises made of wire. A rustic s can easily be fashioned, and this red with ivy is extremely beautiful.

have a few climbers in my garden—sweet , of course, nasturtium, &c.

have one climber that I want to dispense . I found it when I came here ten years e, and it has proved itself a strong grower. verruns everything if let alone, and the e I disturb it the faster it grows. The le plant has a vile odour—to an unpre- ced observer it may seem rather pleasing, this defect; but the *root* baffles me. It creeps, nay, *runs* while I sleep, crawls into the crevices of the wall, and when I began to plume myself on its extermination, it springs with renewed vigour in a score of unwonted places. The fabled hydra was nothing to this vegetable monster, for Hercules had a fair hand-to-hand fight, while my enemy lurks in secret places and flourishes most when I molest most. I suppose it's a kind of convolvulus, but I've never honoured it by an analysis; its root is thick, white, and a perfect gipsy in disposition.

If any of your readers ever succeeded in vanquishing my foe, be sure to give me the *modus*, and I will begin the campaign at once. —*D. H.*

OUR GARDENS IN WINTER.

HE winter decoration of gardens is an important part of the gardener's duties, last winter, which was so unusually urable for such things, set me to con- ring if a set of plants could not be select- which would allow us to do something ty and effective in our less favourable ate. Every year the ground is bare for ths, when it would be cheering to look upon a well-arranged bed, in which the ous shades of green were planted in pleas- contrast. When the snow melted away spring, I saw upon looking across a bed ch had been used as a sort of reception e for odds and ends, a strip of green so h and so peculiar, that I at first did not gnize it. It stood where there had been t of ornamental grasses, all of which, but , had long been cut down by the icy sickle n't print it icicle) of Jack Frost. This grass, Festuca glauca, stood up bright and fresh, as if it, on the whole, rather preferred cold weather. The leaves are stiff and wiry, make dense tufts, and have a peculiar pale bluish-green,—a tint that would form a capital contrast to almost any other shade of green. The plants came from a florist the previous spring in little pots, and last winter I saw it grown in another florist's green-house. It is as hardy as an oak, and a real prize for winter beds.

There are some Sedums too, well suited to this purpose, as are several low growing evergreens. The Retinispora plumosa aurea, which I believe is perfectly hardy, would afford a fine golden colour for the winter bed. If it ever gets cheap enough to be used freely, it can be used with effect in contrast with the low growing evergreens with dark foliage.—*T. B.*, *Inverness.*

WAX-FLOWER MAKING.

CHAPTER IV.

IN my last chapter I called the rose an English flower. By this I did not intend to imply that it was exclusively such, for it is to be found in very remote parts. Even in the desert a kind of dog-rose luxuriates. England has done much towards bringing the rose to the perfection it has attained. Numbers of new ones are raised annually, and some that have been exhibited this year at the various flower shows are perfect gems for copying in wax.

In a tastefully arranged group of roses it is necessary to have a variety of colours; and buds and leaves must not be too sparingly introduced. One of the simplest, prettiest, and most effective-looking is the Rosa canina, or dog-rose. Such a variety, intermixed with the larger flowers, relieves the otherwise heavy appearance of the latter. The flower of the eglantine or sweet brier (Rosa rubiginosa) is a pretty colour, and a much deeper pink than that of the dog-rose. I shall particularise a few of the best roses for modelling in wax, the first being the eglantine, and the second the wild-rose (Rosa canina), that is found in hedges in almost every part of Great Britain; and the third, Rosa spinosissima. Gather a bunch of each colour, select the most perfect, count the petals, and cut the pattern; then lay several thicknesses of the thinnest wax together, wetting each one; cut the petals, and mould them by placing them in the hand and using a medium-sized pin or mould for the purpose; this done, the edges are slightly curled by placing the steel pin, previously wetted, under the edge of the petal, and turning over a very small portion. The seed vessels are made in the same way as already described, or purchased ready for use. Another pretty single rose is the Austrian yellow. The wax may be coloured, or perhaps, in this case it is better to use the yellow wax, as the black shade cannot be obtained.

We now come to the double roses. It would be useless to name any particular ones for copying, as new ones are always appearing; but I cannot omit a very fine yellow rose—Marechal Neil—the finest and most effective-looking of that colour. In order to get the artificial flowers as perfect as possible, two flowers near alike should be obtained: one must be deprived of its petals, the other left whole as a guide. The large petals should be cut first, as there are sometimes sufficient pieces left to cut the smaller ones from. When the petals are cut and nicely rounded at the edges (if a white rose), some bloom must be gently rubbed all over them, with the exception of where they are stuck on the foundation. If that part of the petal be coloured, or have the bloom on, the petals will never adhere together. The stalk consists of a piece of thick wire covered with green wax, turned down at the end, on which some white wax must be rolled to form a kind of foundation to work the petals upon. After the last row of petals is on, then make the calyx, which must consist of two or three thicknesses of wax, in order to form a support for the flower. A crimson rose can be made in the same way, except that the petals are coloured with carmine. The light-coloured tea-rose is made of a very pale yellow wax, and must be slightly tinted with pink. Pink, and indeed all coloured roses, are made after the same manner, the only difference being in the colouring of them.—*Annie M. Williams, Upper Holloway.*

THE

NTRY GENTLEMAN'S MAGAZINE

DECEMBER 1870

NEGLECTED INDUSTRIES.

ERY interesting pamphlet has just een published by Mr David Curror, duckie, Fife, a gentleman who takes interest in all that relates to the so- dition of the people generally, and as all that bears upon the welfare of ure. As long Chairman of a Parochial n Edinburgh, and as Secretary, since mencement, of the Scottish Cham- Agriculture, his opinions regarding st to profitably employ the unem- in conexion with the land, is worth to.

swer to the question, as to where employment can be found for the yed, at which they can earn wages bringing their labour into competi- th the ratepayer, and reducing the upon him, Mr Curror replies (so the honest poor are concerned) in on with—

farming of land.
ning the ocean.

regard to criminals—

lamation of land from the sea.
rison workshops.

erence to the first head in the first we remark, Mr Curror premises the l fertility of land, providing that the s returned to it the constituents with- om it in the raising of food for man. es the Chinese, the Japanese, the pea- Lucca, and the farmers of Baden, as instances of people who recognize the value of this precept, and practice it, by preserving and returning to the earth all the excreta of man, greatly to their own advantage. The value of every adult to the agriculturist, it has been calculated, is 8s. per annum, which is equal to £4000 a-year in a town of 10,000, and so on in proportion, as the population is increased. All this value is wasted, and we are paying at the rate of something like £5,000,000 per annum for artificial fertilizers. Meanwhile, thousands of able-bodied persons are starving in our midst. Mr Curror would have them employed in collecting the excreta from the houses and conveying it to the fields. "All our closets," he says, "run into pipes connected with sewers. Shut off the connexion, and let them run into closed vessels placed outside the house. If wished, shut off the closed vessel from the pipe, and scour the pipe into the sewer with water, as at present. Employ the unemployed to remove these closed vessels at intervals, and carry or cart them to the farmer, leaving empties while removing fulls. A Thomson's road-steamer might be employed to carry away at once the accumulations of a street to a distance to the farmers, who would willingly buy every pound of it at all times. In season, they would at once apply it to the soil; out of season, they could store it in dry earth, which would retain all its properties, and apply it at the proper time."

It would be profitable, also, Mr Curror assures us, for in Germany farmers greedily pick it up at £10, 8s. 4d. per cart. "And is there not, in this city" (Edinburgh), "at this time," asks Mr Curror, "ten men who could collect a cart-load, and, taking it to the country, bring home in their pockets their £1 each, who are now in a state of semi-starvation!" "But we are a great people," sarcastically observes Mr Curror, "and this is too base an occupation for her sons to engage in." But did not the prosperity of the great Roman peasantry decline by neglect of this scavenging? And has not the prosperity of the cultivators in China, Japan, Lucca, and Baden, been preserved and increased by attention to it? And if the gathering of the refuse is not thought degrading even in refined Paris—a city which Mr Curror characterizes by a string of eulogistic phrases, surely her example, if we disregard that of the "pig-tails," might be followed in this matter by a nation of shop-keepers. Mr Curror has no patience with us. "Base employment, indeed!" he indignantly exclaims, "What can be baser than for able-bodied idleness to starve or to steal from others when an honest industry stares him in the face, where an honest penny can be turned, on which he and his may live, and grow, and thrive?"

If we do not thus preserve the refuse of our cities, Mr Curror warns us that our fate will some day be even as that of the antient Romans. But this collecting of excreta would not absorb all our idle population. Vast losses accrue every year to farmers through the prevalence of weeds. It would pay agriculturists to employ a great many women and children in hand-picking these from the soil. Trenching once in five years with the spade, Mr Curror thinks, would, from the extra abundance of crops the operation would secure, be remunerative to the occupiers of land, while providing employment for labourers. Then, in summer, water is scanty, men might be employed in the construction of reservoirs, in which to store the surplus fall of rain in winter. Marshy and boggy lands are unproductive. Labour could be profitably employed in draining them, so that, in the first place, they might grow fibrous grasses for the papermakers, who would readily purchase; and, finally, the lands might be made to yield crops of roots and cereals.

The criminals in Edinburgh gaol Mr Curror would have put to reclaim the land along the Firth of Forth. Lands which have been reclaimed grow excellent crops. There is a vast acreage yet to be enclosed; and engaged in this work the criminal would be a profit to the nation, instead of a loss to the extent of £35 a-year.

This is the gist of Mr Curror's *brochure*, so far as it relates to agricultural matters, and whether we agree with all that is in it, or not, we can say that it is well worthy of perusal.

FARM LABOURERS' COTTAGES.

have noticed with regret that in the
fter-dinner speeches at the Autum-
ltions, little mention has been made
ourers' condition. While we by no
sh the ploughman to be described
rtyr that would-be philanthropists,
nothing about him, have often re-
him to be, we are still of opinion
e are many grievances in his lot
ght be ameliorated, and which ur-
ll for remedy. His wages are
y inadequate, but these, to a cer-
at, must be regulated by the law
and demand. It is to be borne in
, that his earnings, when expressed
r, do not really shew the whole
agricultural labourer receives for
; and that when his perquisites
nity from loss of pay during broken
re taken into account, in pecuniary
he does not rank much below
workmen in towns. What we
, that he should be put in a
o make the best of his money—
should not be compelled to do
less to his employer, and in-
the highest degree to himself.
ances at which many labourers
ural districts live from the scene
occupation, often give them two
hours' work more per day than
tted time. The consequence ne-
s, that the master gets less out of
he otherwise would do, and they,
g home, are more fatigued than if
ived upon the farm, or in its imme-
ity. And then, in wet, cold weather,
n get drenched to the skin and
o the bone—a fruitful source of
m and other diseases, which not un-
lay them up altogether, and cheap
e the doctor's fee, it can ill be
Then, again, the houses, so difficult
from the places of employment, are generally so wretched when they are reached, that the labourer, in the evening, too often prefers the blazing fire and sanded floor of the public house, to his own domicile; and, under the circumstances, it is not much to be wondered at in those whose creature comforts are comparatively so few, and whose means of higher enjoyments are *nil*. Therefore, what we wish, as we have said before, is, that the labourer should have the chance of making the most of his money; and this he can never have until such time as better house accommodation is provided for him on the farm upon which he toils.

Farmers have often been blamed for the character of the cottages in which their servants are housed. They are accused of being heartless, of being destitute, in fact, of humanity, of caring more for the welfare of their cattle than the people who rear them and cut their corn. "Look at this hovel," exclaims the excited social and sanitary reformer, "into which human beings are huddled, and from it turn your eye upon that building where the stock are lodged. What a contrast—what a shameful contrast! The beast has better accommodation than the being who looks after it! And is the reason far to seek? If the animal dies, the farmer suffers in pocket, but he loses nothing by the demise of the man."

We are by no means exaggerating the language that has frequently been used in public assemblies, upon the question of house accomodation in the rural districts. And we are certainly not concerned to dispute that the condition of a great proportion of the dwellings of the agricultural labourers generally is of the most lamentable description. But what we must deny is, that such imputations against farmers, as we have indicated above, are deserved, though we admit that we have seen byres and barns better than the peasant's homes. But the blame attaching to such a state of matters rests only partially with the tenant, it should fall mainly upon the landlords. It cannot be expected that the farmers should lay out their money upon stone and lime for their workers, when they have, in many instances, no satisfactory guarantee of the permanency of the roof above their own heads. And even when farmers obtain a lease, they often get it only on terms so exorbitant that they cannot, out of their own pockets, lay out one farthing on the labourer's houses. But why, it may be asked, if this be the case, should agriculturists have such *fine* homes, as we have heard them called, for their horses and cattle, sheep and pigs, and such miserable places for the workers? It is an easily answered question. The landlord builds good places for stock because he wishes to entice men to offer a greater price for his land; and these elegant and commodious home steadings—frequently out of proportion to the requirements of the farm—induce amateurs to give far more for the tenancy than it is worth, and they find out ere long that they have paid too dear for their whistle. Such outside offerers are common, and landlords know it, and know also that such customers look more to the neatness of the farm buildings than to the comfort of those by whose hands these buildings are to be made profitable.

The only thing of which farmers accused of in regard to house ac dation is, we think, that they do not ently press upon landlords the nece better cottages on the farm—that t not, in fact, fully recognize that inc comfort to the workmen would tend own benefit. The question of the c entirely a landlord's one, as it seem but what farmers could do in the mat endeavour to convince proprietors h vantageous good house accommodatio be for landlords and occupiers alike.

We are glad to know that many la have acknowledged their responsi this matter, and are nobly fulfilli duties as quickly as they can. Th instance we notice is that of the Ma Ailesbury, who "has given direction Bolam, his steward, to erect a numbe proved cottages for the labourers eng his Lordship's estates at Savernake, an finished, to pull down the old and dil dwellings hitherto in use. His Lo few days ago entertained to dinner of 200 of these labourers, at Savernak and this mark of consideration elic monstrative expressions of their appre We hope many other landlords wil his Lordship's example in this matt the reward, as in his case, will be as labourer has to bestow—his blessing

THE BRITISH ASSOCIATION ON AGRICULTURE.

WE are glad to see that a considerable portion of the time of this Association at Liverpool, has been devoted to the consideration of subjects having a bearing on agriculture. Besides the elaborate address of the President, which dealt with the beginnings of life, and which received special illustration from what we may be allowed to term agricultural subjects, we have had essays in a peculiar degree interesting to farmers. Among these we notice, particula of Dr Moffat, read in the Section of under the title of "The Connexion Geological Systems and Endemic D The heading scarcely leads one to t clusion that it has much to do with tion; but the connexion, it would a one of a very vital character. It is nature that it might yet change o system of farming.

CE OF SOIL AND CEREALS ON DISEASE.

rding to Dr Moffat, the soil has an
e on the composition of the cereal
rown upon it, and on the diseases to
the inhabitants feeding thereon are

Dr Moffat practises in a district
ally consisting of the carboniferous
w red sandstone, or Cheshire sand-
ystems. The following is the gist of
er, as reported in a Liverpool con-
ury :—

> habitants of the first, or carboniferous system,
> ed in mining and agricultural occupations;
> the latter, or new red sandstone, in agricul-
> œmia, with goitre, is a very prevalent disease
> those living on the carboniferous system,
> s almost unknown amongst those living on
> red sandstone system, and consumption is
> prevalent amongst the inhabitants of the
> As anœmia is a condition in which there
> ency of the oxide of iron, which the blood
> contains, Dr Moffat was led to make an
> on of the relative composition of the wheat
> the soil of Cheshire sandstone, carboniferous
> millstone grit, and a transition soil between
> sandstone and the grit. The result of the
> ews that the wheat grown on the soil of the
> andstone contains the largest quantity of ash,
> here is a larger quantity of phosphoric acid
> in the soils of the carboniferous and mill-
> systems; also a much larger quantity of
> on than in either of them. He has calcu-
> each inhabitant on the Cheshire sandstone,
> mes a pound of wheat daily, takes in nearly
> er day of the sesqui-oxide of iron more than
> tant of the carboniferous system, and who
> efore to be subject to this great liability to
> n consequence of the deficiency of iron and
> c acid in the food he consumes. It is not
> wheat grown upon the carboniferous sys-
> here is a deficiency in the quantity of oxide
> d the phosphates, says Dr Moffat, but also
> od of the animals reared upon it; so that
> tants upon that system take it in a minimum
> f these constituents of the blood, compared
> aken in by the inhabitants of the Cheshire
>
> He stated that sheep were liable to
> a fact which he attributed to sheep walks
> n trap and limestone hills, in the soil of
> e is but little, if any, iron.

is the inference to be drawn from
ts, if facts they be, regarding agricul-
hat, in the interests of our common
heat ought not to be grown upon
rous soil, nor sheep grazed thereon. If we do grow the one and feed the other there, consumers will soon cease to purchase either our breadstuff or mutton; and if we do manage to get quit of them to unknowing customers, and such results as are described follow, we shall run the risk of being penalized for attempting to injure our neighbour, in addition to the penalty the Prevention Society will be sure to inflict upon us for cruelty to our domesticated animals.

Dr Turnbull, following Dr Moffat, observed that the communication of the latter was a valuable and most important one, opening up a comparatively new subject, which had scarcely yet been touched upon. He said—

> It shewed that there was a connexion between the geological conditions of soils and the health and diseases of the inhabitants living on the soils. It shewed, too, that this influence might be indirect, through the food grown on the soils, and it shewed how the particular disease anœmia, with goitre, might be produced by deficiency of the oxide of iron and the phosphates in the wheat grown on a certain soil. Such facts were interesting, in reference both to vegetable and animal physiology, and practically to the agriculturist as well as the physician. There was another statement in the paper particularly interesting to him—that consumption was less common in the inhabitants living on the Cheshire red sandstone, than in those living on the soils of the carboniferous system. He had himself, in a work on this disease, directed attention to the inequalities in the distribution of this, the commonest of all diseases, and urged the importance of investigating the causes of these inequalities, with a view to their prevention. He had also pointed out that in this town of Liverpool, which had been the most unhealthy, but which initiated sanitary improvements, the statistics furnished by the late Dr Duncan shewed that these improvements reduced, in a remarkable manner, the mortality from phthisis. An inquiry into the results of sanitary measures in twenty-five of the large towns of England, which had been made under the direction of the health officer of the Privy Council, had since proved that drying of the soil by main sewers produced its first and greatest improvement in the mortality of large towns by reducing that from this disease. This had led to the first inquiry which had yet been made into the effects of geological conditions of the soil on the health of the inhabitants. The three south-eastern counties of Surrey, Kent, and Sussex, were carefully examined by Dr Buchanan, under the direction of Mr Simon; and this inquir had, he observed, brought to light the important fact that dampness of soil is a powerful cause of consumption. This might be considered the first fact brought to light in relation to the influence of geological con-

ditions on endemic disease; and Dr Moffat had, in this communication, which tended to bring science to the prevention of disease, brought another fact to light, and had proved that conditions of soil might indirectly influence the inhabitants through the food grown on the soil.

It is to be hoped the subject will be followed up.

SEWAGE AND DISEASE.

In the Section of Chemical Science, a report upon the apparently never-to-be-settled question of the proper way to dispose of town sewage, was read by Mr Grantham, C.E. :—

Professor CAULDFIELD read a supplementary report on an analysis of sewer gases, in which it was stated that the committee had under consideration the statement made by various persons that entozoic disease might be propagated by sewage farms, and had instituted experiments, which were not yet completed, for the purpose of investigating the subject thoroughly.

Dr PAUL said he understood it purported to be a report of the committee appointed by the British Association last year. That committee consisted of six members, and he knew that two, if not three, of them had not taken any part in the report now presented in the name of the committee. For his own part, he desired to disclaim any participation in, or responsibility for, this report. In regard to the action of the committee, outside its functions as a committee of the Association, it had been stated that many towns had subscribed money to enable the members of the committee to conduct the inquiry. However, he wished to express his disapproval of the course adopted by the committee, inasmuch as he considered it to be inconsistent with the pledges voluntarily entered into by the committee when application was made to towns. He also thought that the mode in which the inquiry had been conducted did not promise to give any authoritative character to the results arrived at.

Mr DAVID FORBES, F.R.S., next read a paper, "On the Utilization of Sewage, with special reference to a phosphate process." The Professor, after describing the processes, mechanical and chemical, by which sewage has been dealt with, alluded to irrigation, and said that, while fully admitting the advantage of sewage irrigation applied to certain localities, he believed they would agree as to the importance of searching out for some chemical process by which the sewage might be at once deodorized to such an extent that the liquid could be run off into rivers or the sea without danger to health, and thus obviate the necessity of erecting costly works for its utilization at a distance. In 1845, works were erected in Edinburgh in which the sewage was treated with lime. This had proved a complete failure, both in a sanitary and chemical
point of view. The next system was the tre
sewage with lime and chloride of iron. Th
improvement, but it had also failed. The ne
was founded on the principle that alum ha
purifying effect upon water, from the te
aluminia and its compounds to combine wi
matter. Then came the A B C process, w
effected by an extraordinary combination of su
consisting of clay, alum, and blood; but
the Rivers' Pollution Commissioners had de
have failed in the purification of the wa
Forbes then called attention to what he sai
entirely novel process, brought forward by
and himself. It was founded on the fact th
mineral phosphates, especially those c
aluminia, eagerly combine with the organic
sewage. A solution of the phosphates an
lime was added to the sewage, and the am
precipitated in the shape of a double phosp
Forbes illustrated the process with a bottle
pool sewage, and the result was that, in a fe
the precipitate was seen falling to the botto
the water perfectly clear and free from s
another experiment he added ink to the sewa
gave it a black colour, but the colouring m
at once removed by the addition of the s
phosphates and the lime water. In fact, he
that the sewage water so purified could
without offence, and he caused some amu
drinking a wine-glass of the water clarified
London sewage. Before recommending th
he said they must be prepared to answer two
—first, whether the water was sufficiently p
permitted to flow into rivers; and, secondl
the valuable constitutents of the sewage
precipitated. He proceeded to shew that t
to both questions were satisfactory; and, in c
he expressed an opinion that his process
extremely valuable in such localities as w
unsuitable for sewage irrigation.

NORTH AMERICAN INDIANS AND AGRIC

Another subject which excited
able interest was a paper endeavc
shew the aptitude of North America
for agriculture: and their claims t
couraged in agricultural pursuits, was
urged by

Mr JAMES HEYWOOD M.A., F.R.S.
that, in several cases, there was a decided t
the part of the Indians towards farming,
was every prospect that they would conti
respectable members of society. He urge
Governments of the respective countries s
more money to encourage agriculture amo
dians than they did at present.

Sir STAFFORD NORTHCOTE understoo

emarks rather applied to the Indians who
g settled in the provinces of Ontario and
in the rest of the old Dominion of Canada.
the advantage of a cursory glance at those
thought their general appearance was
ing and satisfactory. There was no doubt
ians were making considerable progress in
nents; but he was not quite so sure that
suit some tribes of Indians would suit all
ne of the hunting races in the Far West
to be dealt with with great care; and
hed to impress upon those who took an
e subject was, that the object should be,
to bring the Indians to a particular pat-
interest the Indians themselves in working
n improvement in whatever way might be
them. By-and-by they might turn the
ty of them into agricultural and other pur-
reat object, however, was not agriculture,
ovement of the races, in whatever direction
pacities pointed out.

FIBROUS COTTON SEED.

e long been recklessly wasting a
ommodity. At least, so we are

AS ROSE, who read a paper, in the Geo-
ction, "On the Utilization of Fibrous
." He said that a vegetable production,
d be valuable, and could be supplied to
millions of tons, was now wasted. The
t was fibrous cotton seed, and in America
than 1,000,000½ tons of the seed were
ly. The seed was composed of 50 per
, which yielded about one-third oil, and
husk-shell, with fibre adhering—of which
uld be one-third. His calculation was
te seeds would produce 250,000 tons of
250,000 tons of oil, and 500,000 tons of
the value of which he estimated at
sterling. The husks could be taken to
ill, and the cotton abstracted in such a
form a most valuable material for paper.
process by which the cotton fibre could be
parated from the shell; and the seed had
ntage, that of unfailing supply. In con-
Rose remarked upon the value and use
the cattle-cake that would be yielded by

CARPENTER informed the meeting of his
taining oil and cattle-cake from the cotton

RMAN, as an illustration of the importance
rial for paper, remarked, that since the
of the present war, the paper-mills of the
ry were working day and night, in order
paper required for the newspapers of the

RAINFALL.]

In the Mathematical and Physical Science Section, the report of the Rainfall Committee was presented. Having detailed the various operations carried on during the past year, the report proceeded to the consideration of the most suitable height for the orifice of gauges to be above ground, and gave various reasons, *pro* and *con*, finally concluding that a foot, as hitherto adopted, be still recommended. It pointed out the great work being done by the voluntary and entirely gratuitous services of nearly 2000 observers, and suggested that it would be alike a graceful and economical act on the part of the Government, were they to offer to relieve the observers from the cost of reducing and publishing the observations which are now, by their accuracy and completeness, accepted as a type by foreign countries and our own colonies, and which are found yearly more and more useful in relation to our manufacturing and commercial interests. A few hundreds of pounds annually would probably suffice to hold together a body of practical observers which has no equal in the world, and which, once broken up, could not be replaced, since, irrespective of the difficulty of training new observers, the continuity of the old observations would be destroyed.

CLOSE TIME FOR INDIGENOUS ANIMALS.

In the Department of Zoology and Botany, the committee appointed for the purpose of continuing investigations as to the advisability of establishing a close time for the preservation of our indigenous animals, presented the following report:—

Having regard to the state of business during the last session of Parliament, your committee have not thought it expedient to press the object your committee are directed to obtain on the attention of members of the Legislature or the general public. Your committee have learnt with satisfaction that, in several cases, where the provisions of the Sea Birds Preservation Act have been enforced, very beneficial results have followed. In consequence hereof, your committee see good reason to hope that an extension of similar protection to other groups of indigenous animals will be attended by similar happy results. And your committee consider that such extension could not be better commenced than with the group of birds commonly known as "wild fowl," comprising, as that does, very many kinds of birds which, being largely used as food, are of great value to the community, and are generally admitted to be entirely innocuous. At present, very great numbers of wild ducks, of many species—snipes, woodcocks, plover, and other kindred birds—are killed during the spring months, even when in the act of breeding. The destruction thus effected cannot fail to continue the ever-increasing diminution of these birds, if, indeed, it does not promise, at no distant day, to result in their utter extermination. Accordingly, your committee are unanimously of opinion that protection should be afforded, by law, during the breeding season, to such wild fowl as these, in order to prevent that result; while your committee think that, with protection, these birds may long continue to furnish at other times of the year valuable food to the public, notwithstanding the changes which some parts of the county are undergoing through agricultural improvements and increase of the population. Your committee respectfully request the re-appointment of this committee.

FIVE DRY SEASONS IN FIFTY YEARS.

MR ASTON, of Brassey Green, Tarporley, thus writes to the *Chester Chronicle*:—The long-expected and anxiously-looked-for rains at length have come to moisten the thirsty and sun-parched ground, and we may hope for a moderate growth of grass to supply the well-nigh famishing cattle. Conflicting are the opinions in which of the three most remarkable dry and hot summers experienced within the last forty-five years agriculturists have suffered the most—1826, the present season, or two years since. No doubt wheat was a better yield forty-four years ago than this harvest produced, but summer corn and hay crops I believe were lighter, and grazing lands suffered to a still greater extent. I also consider the cut of hay-grass better in Cheshire this year than in 1868, and in some counties it is said to be two-thirds of an average crop; but two years ago, the quantity of straw and yield of wheat far exceeded the present season, though our pasture grounds this summer have not been so early burned up, on account of having some cool weather and refreshing showers in the month of June. All things taken into consideration, it is to be feared this year will prove more disastrous to the agriculturist than either of the two preceding seasons referred to. In 1826, wheat sold off the field from 10s. to 11s. per bushel, whereas it is not worth so much by a-fourth at the present time; besides, rents, taxes, wages, and other things, which were much lower in those days than now, which was a great help in an unfruitful season. If we compare two years ago with this season, the former was undoubtedly in favour of the agriculturists, especially if we take into account the losses sustained by the foot-and-mouth disease greatly diminishing the quantity of cheese and butter, beef and mutton, and killing from 2 to 5 per cent. of the cattle attacked in different dairying counties. It may not be uninteresting to some of your readers to take a very hasty glance at fine dry summers which have taken place in less than half a century. The first of these was 1826, when there was a cloudless sky for weeks, if not months, and in some counties cattle were driven miles for watering. It was about the 23d of August when the first refreshing showers descended, and vegetation sprang into life again, and the bleating herds were soon provided with a sufficiency of grass. In consequence of the great scarcity of hay this season, it sold in the following spring from £9 to £10 per ton. 1836 was a dry but cool and cloudy summer. The hay crop was light, and a scarcity of grass prevailed until the close of the season. At the end of the year, a severe frost set in, which continued for some days into March following, after which east winds prevailed to a great extent until near the end of May, when a glorious change took place, and in less than six weeks one of the most prodigious crops of grass was cut that our county ever produced. The early part of the summer of 1844 was very dry and hot, but the droughts did not continue so long as the other four we have had within the last forty-five years. Still, through the very small supply of hay, some was sold in the spring of 1845 for £11 per ton, a price which told fearfully on a few farmers' pockets. The summer of 1868 is well stamped on the memories of every agricultural tyro. The shortness of the hay crop, the burnt up pasture grounds, and great scarcity of water in some districts, will not be readily forgotten. The first rain that was of any benefit in Cheshire, from about the 24th of May, fell on the 11th of August, and showery weather continued chiefly through the month, but the drought set in afresh in September, and pastures again became brown and bare; and though there were short intervals of wet during the two next months, there were no heavy rains until December, after which vegetation assumed a gay and lovely appearance, and white clover was found in full blossom early in February following, and cattle seen pasturing on the lands on a fresh and beautiful herbage, as in the months of April or May. After seasons like this, agriculturists should guard against parting with stock at a great sacrifice. They were somewhat necessitated to do so two years ago, and hurried large quantities into the market, bringing down the price of beef and mutton, in consequence of which a scarcity ensued, and caused dairy stock farmers, graziers, and feeders, last spring, to pay from £1, 10s. to £3 per head more for cattle than their real worth. We must try to economize food, and hope things will turn out better than our doubts and fears would lead us to imagine. I consider straw in dry seasons is better for cattle than hay badly harvested. My stock never did better, if as well, as last winter but one, when consuming wheat-straw and pasturing in the fields; and I intend sticking to as many as I possibly can through the coming winter, from the conviction that a scarcity generally takes place after seasons like the one we are now passing through.

RURAL LIFE IN ALSACE.

THE following paper (translated from the *Journal d'Agriculture Pratique*), apart from the interest which attaches to the subject of Alsace (the province in the north-east of France, which, with Lorraine, has been seized by the victorious Prussian troops), possesses a further interest from the fact of its being written by a gentleman well known to those agriculturists of this country, who have during some years past visited the various agricultural gatherings in France. The author is M. Eugene Tisserand, who has for fifteen years filled the onerous post of private secretary to the Emperor Napoleon, so far as regards the management of the well-known Imperial farms established in various parts of France, and efficiently maintained from the private resources of the much-abused Emperor. M. Tisserand came to England about eighteen years ago; and after visiting several of its best farmed districts, proceeded to Scotland, where he resided for more than two years, at the special request and at the expense of the Emperor. During this period he carefully studied the various systems of agriculture in Scotland, and for nearly a twelvemonth resided with Mr M'Combie, of Tillyfour, one of the present members for Aberdeenshire, a gentleman well known as the largest and most successful cattle-breeder in the kingdom. On his return to France he was appointed by the Emperor to the position he has since held, with so much advantage to the progress of agriculture in France. M. Tisserand's circle of acquaintances in this country is a large one; and many who have had occasion to visit Paris on business or pleasure during the time he has been connected with the Imperial household, speak in the highest terms of the assistance and courtesy rendered by him. Whatever may be the end of this cruel war, we trust that the farming establishments with which he has so long been connected, will be maintained in their efficiency, as they are universally acknowledged to have had great influence on the progress of agriculture on the Continent.

Amongst the causes which have, in some measure, produced agricultural richness in Alsace are, besides the fine climate and soil, the extreme aptitude of the rural population for agricultural labour, and the marked predilection which they have at all times shewn for it. Highly favoured by Nature, the Alsatian soil has been well cared for by its possessors. It could scarcely be otherwise in a country where the taste for being landholders is widely spread and ingrafted in the people. This alone is sufficient to explain the importance which rural life has always had in Alsace—an importance which has never ceased to increase.

Descended from races that for the most part thirsted for independence, the Alsatians have instinctively been led to aspire to be landed proprietors—a sign and a guarantee the most efficacious of all rights to attach them to the labours of the field.

In fact, the circumstances of its history, political and economical, the primitive organization of property, its excellent rural institutions, all tended to favour its natural dispositions. Very early, the number of landed proprietors was considerable in Alsace, and the contracts under which land was let were such as to result in making the tenants in some degree proprietors. The chiefs found their own interest in these contracts, which procured them fixed and considerable incomes by means of long and short leases. For the security of their claims, it was necessary to study the resources of each tenant, and, consequently, to multiply the tenancies, the better to ensure or secure the returns. The licensed notary of the district appointed a collector for all payments, which eased the proprietors from the trouble of collecting their revenues, which were divided into so many small parts, or properties.

It was only, it is true, transferring the public domain; but it was transferring it in perpetuity, reserving only the right of entailed property. It was sufficient to examine the land register or rent-roll of any township in Alsace to perceive how these contracts were in general use. Entailed property, subject to rent dues, formed the larger portion of the land. "Every homestead must have food," was the general remark concerning house property. "Every field is worth its fixed dues" to the jurisdiction, subject to taxes. Thus, everything conspired to give value to the possession of land.

It was the interest of the nobles which induced them to make their vassals and tenants real proprietors; so that the Revolution, in abolishing the distinction between free and entailed property, only confirmed a transformation which the course of things had already nearly accomplished. Again, we must remark that, amongst the antient rural institutions of Alsace, one above all—the organization of copyholding—was very much spread through all the plains of the Rhine, and has contributed greatly to render rural life attractive. The subject of these antient rural institutions, which we offer to the notice of our readers, is a curious study, which has lately been brought to light by learned researches and interesting debates. These documents serve to explain to us still better why the desire to acquire land has at all times in Alsace been so great. They shew us, in effect, a great number of rural townships in Alsace endowed with rights and guarantees at a period when they had no occasion to ask for the franchise, either from royal favour or from successful insurrection. The copyholders were not entirely separated from those who profited by long leases; they were united by a tie of responsibility for the payment of the rents or dues, and formed, at the same time, a power, in virtue of which the tenants themselves decided upon the difficulties attendant upon the execution of leases. This contract thus became a kind of charter, in which was stipulated the obligations on one side, and limited the duties on the other. These townships themselves regulated the affairs of the copyholders, and generally chose from their own body the officers who represented this copyhold property. Its members being able to dispose of their tenures, could not be dispossessed without the sentence of their peers, nor have their rents arbitrarily increased. In fact, the tribunal or court of copyholders, although exercising a jurisdiction limited to the affairs of landed property and rural offences, sometimes extended it even to criminal causes. How is it possible not to be struck with the influence which these kind of institutions must have exercised over the destinies of rural life in Alsace? It is true that the organization of these tribunals changed with time, and lost much of its value. The increasing importance of the larger proprietors whose duty at first was to protect the copyholders in consideration of certain advantages, and the foundation of large municipalities, and of free and imperial cities, changed by degrees the functions of the copyholders as a tribunal from what it had been originally (a simple association of farmers), until it grew to have the sole jurisdiction of landed property. But in spite of the numerous vicissitudes through which the rural institutions of Alsace have passed, in this province may be found the cradle of rural municipalities, the beginning of self-government and liberty, in a word, all agricultural advantages, and that which renders the possession of land precious. The Alsatian literature, if we refer to it, would furnish curious proofs to establish the taste which the population of this province had for rural life. In fact, there are still extant numerous poems, didactic and satirical, songs, and popular tales, and proverbs, in which these tendencies may be found clearly indicated. The greater part of them bring to light the great desire for being land proprietors, and the value attached to the freedom of the soil. For the rest, it will be sufficient to render this truth more impressive, to call to mind the rising *tumultus rusticanus*) of the Alsatian peasants, caused by their pretentions and grievances, which, after having lasted thirty-five years, terminated tragically by the defeat of Scherwiller and of Saverne, 1425-1490.

When we take a view of the agricultural population of Alsace, and propose to study its life, we are struck at first with the varied phases which it presents. It seems to accommodate itself to the different natures of the soil, and to change with the different divisions into which the province is divided. Are we to believe that the inhabitants of the three divisions re-

it three distinct populations, and seek in ethno-
an explanation of these differences? Or are
recognise in the mountainous regions the chased
sh tribes, of wandering habits, sharp wit, and
movements; and in the hilly regions, the mixed
which have by turns occupied the country,
cterized by more sedentary habits and robust con-
ions; or finally, do we find in the plain, or above
n the banks of the Rhine, the German type, or
ure Frank or free man?

e acknowledge that we are not by any means
ted to define this question of origin, which has,
ver, the advantage of having been studied by
learned men. It would be wrong, besides, to
ct, or to attribute to these three types, the dif-
ces which are perceptible in Alsace, in the lines
physiognomy, and the manners and habits of
gricultural population. There are other causes
are not less prominent, and, above all, that
determines the diversity of languages. In fact
e a German population in close proximity to one
French. By a singular effect of events, from
ain of the Vosges mountains, which separates
eoples of very different origin, has come forth
its western region an entire colony, which has
ed the valleys of d'Orbey, of Sainte-Marie-aux-
s, and of Ville-de-la-Bruch, situated upon the
ian declivities. Notwithstanding the neighbour-
and the contact of the German races, these
ations have preserved for centuries the same
ers, the same habits, and the same language.
French population, in a part of the division of
t, is also distinguished in many ways from the
itants of German Alsace.

is singular variety of types is not, most assuredly,
f the least attractive features which the study of
ral population of Alsace presents; it is calculated
ke us still more, as there are few other provinces
e same nature—a remarkable example of the
ice that there would be in confounding unity
uniformity. But that which must interest still
an attentive observer, is the strict harmony
exists in this country between the character of
nhabitants and the physical conditions in the
of which they live. Undoubtedly we may
see this influence, and it may be studied else-
; but it certainly offers a particular interest in
e, where it is confirmed, thus to speak, at every
and where each agricultural region, as we have
ked above, offers a different type. Here the
itant of the mountains has a prudent and reflec-
ind, a little mistrustful, but good and hospitable,
same time slow and tenacious, capable of great
e, but often weak in appearance, sober and
. The inhabitant of the hilly district, or wine
y, is full of strength, willingly giving himself up
asure, and putting vigour and energy in all his
rises, and, above all, proud of the country
he inhabits. The inhabitant of the plain is
calm and more reflective, controlling his energies, applying himself to labour, persevering in his designs, and fond of regularity. Finally, the inhabitant of Sundgau is naturally hardy, enterprising, quick to anger as to kindness, rude in manners, and vindictive in feeling; in fact, full of natural qualities, but without cultivation.

It may be interesting to remark, besides, that a great difference exists in character between the inhabitants of Upper and Lower Alsace. It is generally acknowledged that in Lower Alsace the manners are more gentle, the ideas more peaceful, and the general disposition contented. In approaching towards Switzerland, in reaching higher lands, the character is stern, energetic, and spontaneous. But we must at once remark that, notwithstanding these contrasts, Alsace does not any the less present a type which comprises all these varieties—a type which has continued much the same if we may believe the evidence of the last one or two hundred years. We may, for instance, describe the Alsatian peasant, as Monsieur de la Grange did, in the eighteenth century, when he said—"If the inhabitants of this country are good and of a contented disposition, they do not care about being guided, and will not give up willingly their antient customs. They are not naturally quarrelsome. They love peace."

The different traits of character and of manners peculiar to the inhabitants of the various regions into which Alsace is divided, were, as we have said, of a nature to exercise a very considerable influence upon the physiognomy and organization of rural life in these parts, but very soon a new fact sprung up, which was not of less importance, and of which we shall now speak. This was the assembling, or gathering together, of all farming lands and things appertaining thereto. In fact, in Alsace, except in the mountainous district, and in Sundgau, a single farm is seldom or never seen; farms are never to be found in disadvantageous positions. In the mountains, outside the principal habitations which constitute the village or borough, all is scattered. Sometimes the farms are in groups of four or five, very often on the declivity of the mountains, and even on the summits. Elsewhere all the farms are concentrated in a place or point.

This fact is evidently contrary to the natural order of things; it involves too much complication not to have been caused by circumstances.

One may perceive, in effect, the increase of expense of every kind, and the additional fatigue imposed upon the agriculturist, his land being sometimes situated at 3, 4, or 5 miles from the village or town where he lives. Little as we may care to seek for the origin of this singular fact, we are led to assign, as a first cause, not only the want of security which would have forced the inhabitants of the country to concentrate themselves, and fence themselves in, but the division of property, which may be observed even from the very beginning of Alsatian agriculture. As we have already had occasion to say, this minute parcelling out suited well the Alsatian soil, and the diversity of its fitness to its fertility.

However far back we may go in the history of Alsatian property, we may find companies of estates or lands, composed of detailed lands scattered in various places (called cantons) under one ban, or township, or even under several bordering townships: they consisted of meadows, fields, clumps of trees, osier grounds, and vines. It was a very decided opinion then with the agriculturist, that he ought to have at his own disposal every kind of production necessary for domestic consumption. These estate or land companies were not a united body, unless they belonged to one proprietor, or were attached to the same leasehold or entailed property. The copyhold constitutions, which signified lands given on lease, shews that lands thus secured were composed, generally, of a certain number of surveyed properties, situated in different places, and not forming a whole. Some antient works give us also curious details of this organization; they are, in particular, *Le Georgicum*, &c. However, we may infer, from the most antient documents of the tenth and eleventh centuries, that there were isolated farming lands, and a number of single farms, as are met with in the mountainous districts and in Sundgau, and these were more numerous in Alsace; but the want of security, which increased towards the end of the thirteenth century, hastened the movement of concentration in towns. We must here add that they retained the obligation of having the same system for farming lands, which obligation was detrimental, on account of the minute parcelling out, which rendered it almost impossible for the farmstead to be in the centre of its lands.

For the rest, this concentration has been aided by time, and has not been accomplished, it may be presumed, without transition. The first of these formations were but of little importance, and therefore more numerous. The boroughs or towns were formed by the union of these groups. Many documents of Alsatian history confirm this opinion. A learned German, who has studied this question in its most interesting details, thinks that he is [illegible] affirm on principle. [illegible] every village [illegible] whose inhab[illegible] [illegible]

prising that it should have been desolated by constant wars. The growing pretensions of the lawyers, or land agents (*avoues des colognes*), their power, and their exactions render the country unsafe, and caused the rural population to seek that concentration in fortified places. The chronicles of this province furnish examples, without number, of the devastations to which the country of Alsace has been subjected. It is enough to mention the distressing evidence which the chief council or court of Alsace attested, that from 1637 to 1638, that is to say, at the end of the thirty years' war, there was scarcely a village inhabited between Bâle and Strasburg.

But whatever may have been the cause of this formation or assembling of farming lands, the consequences have been great, and in some cases perhaps decisive. For example, if at first its object was agricultural pursuits, and they failed, it was not difficult to turn to other employments. Two elements, two minds were to be found in these populations, the importance of which has been increasing: refinement, or town life, and rural occupations. Little towns had been merely large farms, which had by degrees been transformed. The union or assembling of so many interests had rendered possible many enterprises which isolation could never have realized. Each of these communities began by attracting a number of strangers, more or less, to their markets; by degrees the taste for instruction, and even for the arts developed itself. There was an energetic life in these towns,[1] in these proud little republics, which discussed and acted. Labourers and vinedressers who formed the greater part, brought with them their active and independent habits, their energetic manners, their daring, and their firmness. Nothing is more striking in the history of Alsace, from the fourteenth and the fifteenth centuries, than the flourishing condition of these little towns and these little boroughs, envied by the distinguished men of the province. There is to be found there, really home science. Schools have multiplied principally since the thirteenth century, and there were towns, such as Rouffach, not simply the capital of a canton, which [illegible] threw real lustre over all Alsace. Many other towns and boroughs might be named, such as Schlestadt, Molsheim for example. Besides this, [illegible] important little boroughs were [illegible] amongst themselves rich [illegible] the lower grades of [illegible] Thus Alsace had [illegible] ch was a grievance [illegible] general an injury to [illegible] s to say, absenteeism, [illegible] through Germany. In [illegible] sufficient attractions to [illegible] excite the generous activity [illegible] give free scope to enter[illegible] to satisfy vanity. Still there [illegible] Alsace, immense territorial pro[illegible] sufficient to name, besides the

Agricultural Engineering.

MACHINERY FOR BEETROOT SUGAR EXTRACTION.

THE extraction by means of the hydraulic press is a process of apparent simplicity, but in actual practice it is one of the most tedious and costly operations in the whole sugar factory. It is not possible to operate with the press upon large undivided masses of the pulp. The pulp must be packed between woollen sheets in layers not not exceeding ½ inch in thickness, and these again must be divided by sheet-iron trays. A pile is made up of these woollen sheets or bags filled with pulp, and this is exposed to the action of the press. The operation of filling the bags and forming the piles requires skilled labour of a special class. The quantity of work done by the same press when attended by a set of fully experienced hands, as compared with a less experienced or less harmoniously disposed number of workmen, varies by more than cent. per cent. The operation of packing the beetroot pulp and forming the piles for the press, however, forms only half of the work actually required for this process. There remains the unpacking of the expressed pulp, and the washing of the bags. There is, moreover, an important operation which goes on continuously in every beetroot sugar factory working with hydraulic presses, viz., the mending and darning of the woollen bags. All this makes the work of hydraulic presses a matter of great inconvenience and expense, and has given rise to the numerous inventions of other methods of juice extraction, which have been introduced with greater or less success. The so-called "continuous press" of M. Callatto and M. Champanois, which is nothing but a roller mill similar to those employed for grinding sugar-cane, is a simple and powerful apparatus. It avoids the necessity of using bags, and dispenses with manual labour to a great extent, but it has the disadvantage, common to all roller-squeezing machines, of leaving a very considerable portion of the juice in the pulp, and thereby causing a very serious loss of saccharine matter, which cannot well be afforded in the modern sugar manufacture. This loss is somewhat reduced by a second operation in a similar rolling mill, in which the expressed pulp is treated for a second time in contact with a quantity of water. This additional yield of sugar, however, is obtained in a diluted state, and the cost of evaporating the additional quantity of water very often counterbalances the gain from the yield of the sugar obtained by this second process. For these reasons the roller press has found favour only in beetroot distilleries for the manufacture of alcholic spirit from beet. Another method of extracting the juice from the beetroot pulp is the employment of centrifugal force. A cylindrical vessel, having its side formed by wire cloth, and revolving at a very high speed, is the only machine required for this process. The pulp is charged into this vessel, and, by the action of centrifugal force, it spreads in an even and uniform layer all over the cylindrical surface of the wire cloth. The centrifugal force drives the liquid through the perforations of the cylinder, and the solid pulp is left behind. The action of the machine is assisted by a quantity of water added in a constant stream. This water increases the yield of sugar, but at the same time it reduces the density of the juice.

The above named processes are all applied to beetroot pulp, as they require the previous destruction of the cellular structure of the plant; there are other processes by which the sugar is extracted from the plant without breaking the individual cells.—*Engineering.*

Our Pasture Grasses.

HOLCUS MOLLIS (Linnæus)—CREEPING ROOTED SOFT GRASS.

YNONYMS—*Gramen caninum*, couch grasses, or dog's grass, of Gerarde, 1597. *Gramen caninum longius radicatum*, of Bauchin, 1650. *Gramen miliaceum aristatum molle*, of Ray, 1660. *Gramen paniculatum molle*, of Morison, 1680. *Gramen miliaceum aristatum*, of J. Rajus, 1686. Also known by the additional English names of soft couch grass, and bristle-seeded soft grass.

DESCRIPTION.

ROOT perennial and extensively creeping. Fertile, or flower and seed-bearing tems, usually between 15 and 24, but occaionally from 30 to 36 inches in height, rect, cylindrical, smooth, and having four or ve joints covered with reversed down or ne hairs. Leafy or barren stems also erect, bout half the height of the preceding, and enerally much more numerous. Leaves of light dullish green colour, broad, flat, lightly roughish, and of a downy softness to he touch on both sides; the upper fertile tem leaf much shorter than its inflated-like heath, and furnished with a blunt membranous ligule at their junction; the others all onger than their sheaths. Inflorescence in ompoundly branched panicles, which are ccasionally slightly drooping at their extrenities, the branches being in pairs, spreading omewhat horizontally, and covered with ninute hairs. Spikelets of two long-stalked lorets, contained in a two-gloomed membranous calyx, both of which glumes are about qual in length, roughish on the sides, hairy n their keels, and acute, the upper or largest eing three-ribbed, while the lower is without lateral ribs. The upper floret is longishtalked, almost always abortive, much smaller han the lower one, furnished at the base ith a tuft of whitish hairs, and an awn, ully equal in length to the palea, proeeds from a little under its summit; which wn is rough surfaced, becomes bent when ry, and protrudes conspicuously beyond the alyx. In the lower floret the outer palea or adhesive seed scale is awnless, oval in form, about half the length of the calyx, obtuse at the summit, with three long hairs at the base, and destitute of lateral ribs; the inner palea is about equal in length to the outer, membranous, obtuse, delicately fringed on the margins, and, together, they form the hardened polished coating of the matured seeds. Flowers from the middle to the end of July, and ripens its seeds in a fortnight or three weeks thereafter.

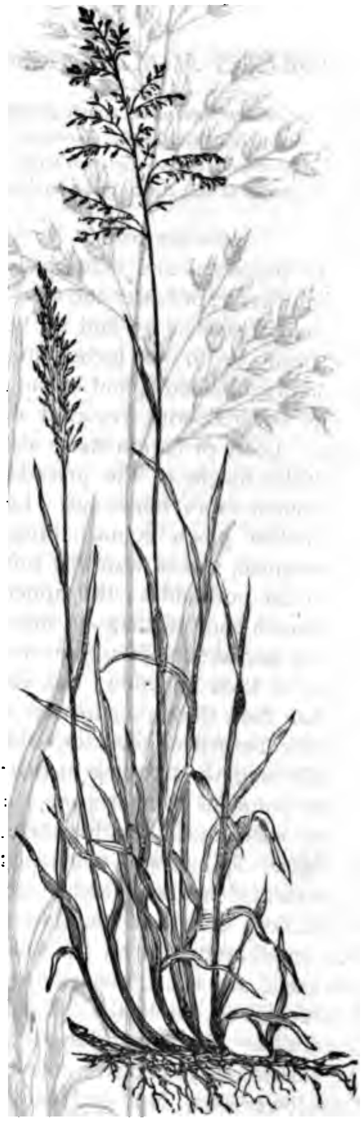
This is easily distinguished from the only other common species, H. lanatus, by its creeping roots, conspicuous awns, and numerous upright leafy shoots.

NATURAL DISTRIBUTION.

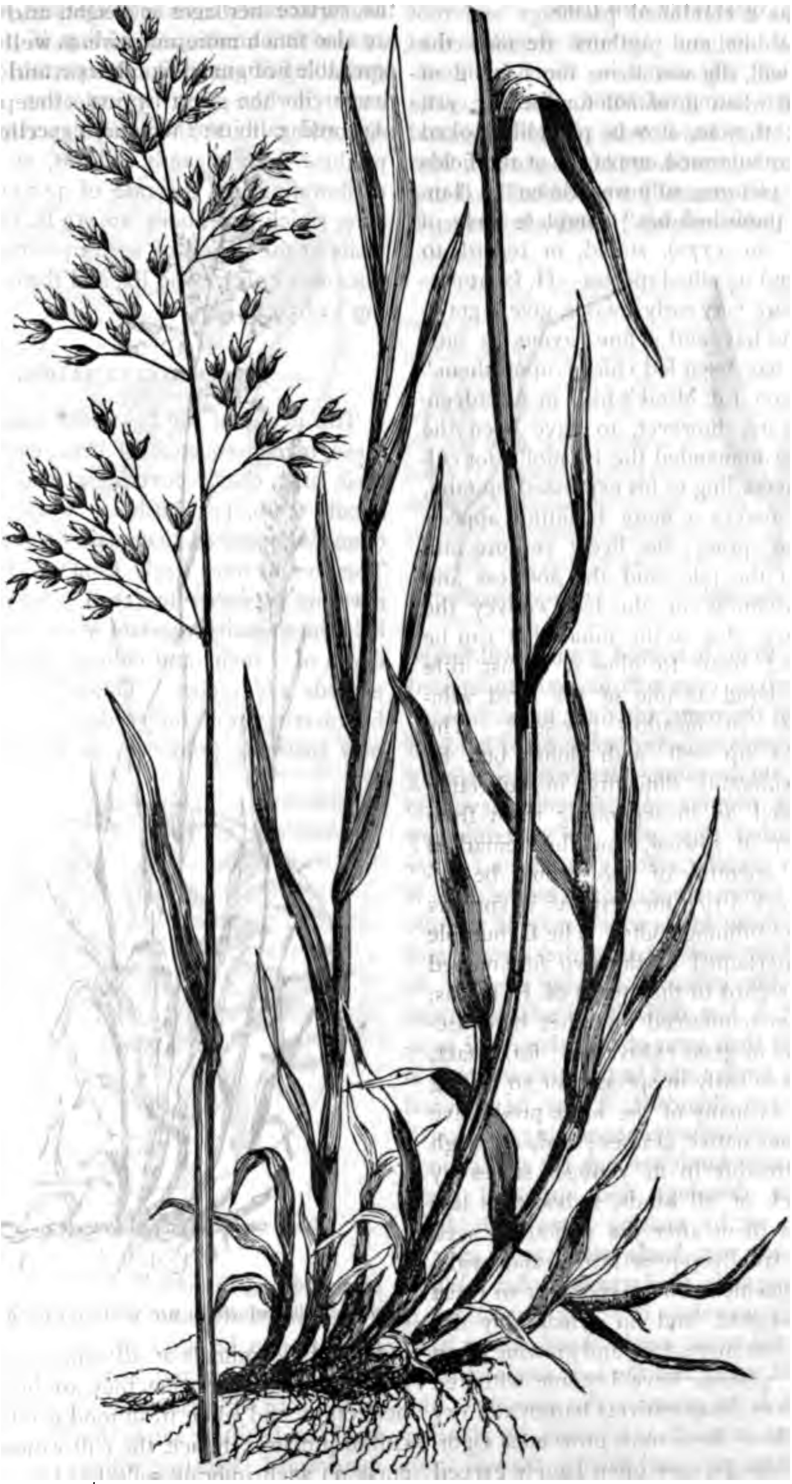
Common, but by no means regularly distributed throughout Britain, being comparatively rare in some of the richer agricultural districts, and seldom found at elevations of more than 1000 feet. Most abundant on sandy, gravelly, and light, dry, ferruginous or moorish soil, both in exposed and moderately shaded places, but attaining to its greatest height, as well as largest root and plant development, in such drained and otherwise improved deep lands, as are composed of inert peat, mixed with clayey loam. Also found throughout Europe and northern Asia—to near the Arctic Circle, but neither in North America nor in the Southern Hemisphere, except where supposed to have been either accidentally or intentionally introduced along with seeds of other European grasses.

QUALITIES AND USES.

Although antient authors deemed the roots of this efficacious in the healing of wounds and curing of some diseases, yet, even in their time, it was generally looked upon as "an infirmitie, or plague of the fields—nothing pleasing to husbandmen." Hanbury (who published his "Complete Body of Gardening" in 1770), stated, in regard to both this and its allied species—H. lanatus—"that they are very early grasses, give a grateful odour to hay, and a fine flavour to such mutton as has been fed chiefly upon them." Dr Anderson (of Monk's-hill, in Aberdeenshire) appears, however, to have been the first who recommended the H. mollis for cultivation. According to his expressed opinion, "no grass makes a more beautiful appearance in the spring; the lively verdure and closeness of the pile, and the softness and succulent richness of the leaf, convey the most pleasing idea to the mind that can be desired, and seem to give it a just title to be considered as one of the most valuable kinds of meadow grasses." The seeds came up well with him; but he found considerable difficulty in collecting them, as well as in separating them from one another at sowing, and he remarked that a small quantity of these would be sufficient to stock a rich meadow, as it spreads so fast by its running roots. The favourable opinions entertained by the two fore-named authors, in regard to the merits of H. mollis, has not been acquiesced in, either by subsequent writers or grass cultivators; for, in fact, it is neither so early in spring, nor so lasting in autumn, as many of the more productive and nutritious native grasses; and, although devoured greedily in its younger stages by grazing stock of all kinds, it becomes less palatable to them after the period of seed ripening. Its deep-penetrating and wide-spreading succulent roots enable it to resist extreme droughts, and in remarkably dry summers it continues green and growing when most other grasses have become withered and bare. On comparatively barren and dry light soils, where these roots grow most vigorously and profusely, they often largely exceed the surface herbages in weight, and as
are also much more nutritive, as well as
agreeable bean-meal-like flavour, and gre
devoured when got at by cattle, sheep, ho
pigs, and rabbits; they afford excellent
ing for these animals at all times, and m
especially in winter, when they are in great
perfection, and when fresh food is often di
cult to procure; hence, the cultivation of t
grass on such inferior soils has been reco



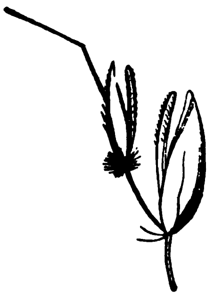
Holcus mollis, reduced in size, shewing habit of gro



Holcus mollis—natural size.

mended as a combined pasturage and root crop. Rabbits, and pigs that are allowed to roam at will, dig out these roots for themselves, but when intended for feeding cattle or horses, they have to be ploughed up and grubbed or harrowed out of the ground, then gathered, and generally washed before being given to these animals; sheep, however, if driven on to the harrowed ground, will forage for themselves, even scraping out unexposed portions of the roots, and deer, hares, rabbits, as well as pheasants and some other kinds of wild fowl, do the same. Its drought-resisting and strong root-matting properties have also recommended this grass for covering dry sandy or gravelly railway banks and other naturally barren slopes with verdure, and it is one of those kinds which may be usefully employed for consolidating the surface and checking the influx of blowing sands. As a weed it is less difficult to extirpate from arable land than some of the other rapid root-spreading kinds; and in pastures where it is naturally too abundant, it may be reduced within proper limits by encouraging the growth of more useful kinds through the applications of surface dressings, and approved grass manures; or by coating them with from forty to sixty cart loads per acre of clay or other strong soils, road scrapings, &c. When abundantly prevalent in young plantations, it is one of the worst weeds that foresters have to contend with; and the best mode of overcoming it is to promote the growth of the young trees as much as possible, by planting them in large pits, and mixing the soil from which its roots have been cleaned, with such as the fore-mentioned, adding, if possible, a sprinkling of guano or other portable manure, early in the first spring after planting. According to the Woburn experiments, its produce from a sandy soil was, at the time of flowering, at the rate of 34,031 lb. per acre, which lost about 20,419 lb. in drying; while at the period of seed ripening the produce was only 21,099 lb., and the loss in drying 12,659 lb.

Calyx magnified.



Spikelet magnified.

SEED AND CULTIVATION.

This is one of the lightest seeded grasses; these, in consequence of being enveloped in their large chaffy coverings, weighing only about 6 lb. per bushel; while a single ounce is computed to contain 85,000 of them. They braird most freely from under an earth covering of rather less than ½ an inch, only half the quantity vegetate when covered to a depth of 1 inch, and none braird when that exceeds 2¼ inches. This necessitates careful covering in of the seeds, but as these are only sparingly produced, as well as difficult of collection, the cost is so high that even the very limited demand which exists for them cannot often be supplied. As a mixture for poor dry pasture land, a single pound of seed to the acre will generally suffice; but for dry banks and shifting sands that quantity may b quadrupled. Planting will, however, generall

Clean seeds, magnified to three diameters.

d a preferable mode to sowing for
it, and this may be effected either by
g with a plough, spade, or dibble, from

s usually sold, magnified to three diameters.

8000 fresh pieces of roots per acre,
g to the purposes for which it is in-

CHEMICAL ANALYSIS.

analysis given in the "Hortus Gra-
Woburnensis" is the only one of this
ich we have met with; according to
utritive matter was, at the time of
g, about 2393 lb. per acre, which
reduced to 1154 lb. at seed ripening,
the loss in nutritive matter by allow-
crop to stand till ripe was 1239 lb.,
more than half its value—a result in
nformity with the disrelish that cattle manifest to this grass after it has passed the period of its flowering.

VARIETIES.

Although this species generally presents little diversity in appearance, except what may be referred to the influence of soil and exposure, the following four forms are referable to it:—

1. *Holcus mollis vera.*—The most common or true form of the species, as described under our second heading.

2. *H. m. biaristatus*, in which both the florets, instead of only one of them, are furnished with long dorsal awns; it has also fewer, but larger spikelets; and is frequently met with in damp shady woods, and occasionally in open boggy situations.

3. *H. m. parviflorus*, in which the spikelets are only about half as large as those of the first, and the plants are also of diminutive growth, being only from 9 to 12 inches high. Found in dry sandy woods.

4. *H. m. variegatus.*—The variegated leaved soft grass, frequently, but erroneously, named H. lanatus variegatus in nursery catalogues. A handsomely striped leaved variety, the leaves of which, when young and shaded, are conspicuously striped with pure white and green; but when older and fully exposed to the sun, the addition of reddish or pink stripes is very conspicuous. Found, in 1858, by the writer, in the Lawn Park of Preston Hall, Mid-Lothian.

The Farm.

THE TURNIP CROP IN SCOTLAND.

FROM Edinburgh, by the Caledonian Railway, the turnip crop throughout Mid Lothian may be described as much under average. After leaving this county, the crop is a healthy and good one, save on some dry portions of fields along the Clyde, and similar satisfactory appearances are noticeable along the Clyde and Solway water-shed. In Linlithgowshire, some fields and patches exhibit the appearance of total loss in both leaves and bulbs, caused by the combined effects of drought, mildew, and greenfly, but by far the more prevalent appearances of only yellowish outer and green centre leaves, with more or less of the bare earth shewn between the drills, indicate only cessation of growth or premature ripeness; and although, in most instances, the average weight of crop may be nearly maintained, the keeping properties of the roots cannot fail to have been materially lessened. On the higher grounds, as well as in most hollows, and in some northerly exposures, more healthy greenness is exhibited, shewing much heavier as well as sounder crops; but, taken altogether, there appears to be fully a-third under the usual average crop.

In the neighbourhood of Falkirk, and onwards to Stirling, almost total loss appears conspicuous on some dry gravelly soil; and although fields in which the foliage is only partly yellowed prevail, yet in the lower carse lands, wherever good brairds had been obtained, appearances are much more favourable, being in some parts really excellent, so that, throughout, the crop may be estimated at little or nothing under an average. And the same remarks are applicable to the opposite side of the Forth, from its firth or frith upwards.

On the deep rich soils which prevail along the wide valley on both sides of the Stirling and Balloch Railway, as well as on those towards it western extremity that are more upland and moorish, the severe autumn drought has had but little prejudicial effect. And as throughout this district the brairding as well as early growth was largely promoted by genial rains, all kinds of turnips, but especially the swedes and yellows, are unusually bulky as well as healthy in appearance. The crops, as a whole, being considerably above the average—and in fact rarely exceeded, even in this district, which has long been famous for turnip culture.

Ascending by the Perth line from the vale of the Forth, yellowness in foliage is rather prevalent till the upper limits of wheat cultivation are attained, about Greenloaning Station, but from thence it only appears in patches on the driest gravelly knolls; and whether looking up over the westerly slopes of the famed Sheriffmuir and higher Ochil hills, or across the wide flat expanse which stretches in the opposite direction to far beyond the renowned Roman Camp of Agricola at Ardoch, almost all the turnip fields display a luxuriant greenness, indicative of a crop that is seldom surpassed in bulk and quality. Descending from the Crieff Junction into the valley of the Earn, the change from fresh greenness to yellowness increases rapidly. And as dry gravelly land is prevalent in this portion of Strathearn, especially on its rising grounds, the drought effects become more evident downwards, till the train enters the Moncrieff Tunnel, under the ridge which here separates between the Earn and the Tay, and the crop throughout this district can hardly be estimated at more than half that of average years, although it improves as the higher grounds to the south end are ascended.

In the northern vicinity of Perth, as well about 20 miles eastward in Strath- ellowish foliaged turnip fields are oo frequent, but the braird seems y to have been pretty regular; and, some small portions indicate the nce of finger-and-toe, as well as nearly ss from autumn drought, yet taking er along with the lower grounds, the y be considered an average one.

ghout the Carse of Gowrie, the late and autumn drought was fully as as in any district of Scotland, which, connexion with the difficulty of re- he heavy carse lands to a favourable for seed brairding, has resulted in the fields being rather thinly stocked nts. When once these are fairly es- d, however, in such soils, they resist in a remarkable manner, hence, exception of some portions on the f the Carse, where the soil is com- ly shallow and dry, all kinds, but rly the swedes, are remarkably large d entirely free from yellow foliage, so present crop is looked upon as un- d within the last three years, and tanding its thinness in some places, considered of more than average ce.

e highly important agricultural dis- nprising the counties of Fife and are exhibited all the phases which p crop this year presents. In the rts of Fife, along the shores of the Forth, St Andrew's Bay, and the er fully a-fourth part of the country oss and stagnation in growth are al- prevalent as in East Lothian, or rst districts of Scotland, so that the carcely half that of ordinary seasons. out the intermediate third, yellowness of leaf is also very marked, and it may be set down as being fully a-fourth deficient, but in the remaining, or higher portion, it may be estimated at a fair average. While in the county of Kinross, which is all upland in character, hill environed, and in general well wooded, the rainfall has been more frequent, and the turnip yield is decidedly super-excellent.

Throughout the forementioned districts, the last of harvest operations, potato lifting, was far advanced; and those whose crops were still unsecured were, in consequence of the broken state of the weather, beginning to blame themselves for delaying too long. All were sound, in so far as we could learn, except in some of the lower peaty soils of Strathmore, where disease was plainly perceptible in some of the tubers. These, their owners were wisely carting to the potato mills, of which there are plenty in this district. And the abundance of potato pits everywhere, induced the general belief that the present was one of the largest, if not the very largest, crops that had ever been raised.

Wheat sowing after potatoes was generally in progress, and although occasionally interrupted by heavy rains, the dryness of the soil and subsoil quickly absorbed all superfluous moisture, so that a good seed bed was obtained; ploughing, and wheat sowing after fallow, and early removed turnip crops was being proceeded with. And in the Carse of Gowrie which, when Davidson, of Dundee, wrote his "Modern Agriculture" in 1795, and long after was famous for its September-sown wheat, we only observed one field of that once principal crop, and it was a good one, entirely covering the clods by its rich growth of waving foliage.

PREPARATION FOR AND PLANTING OF FARM CROPS.

Paper read before the Winfrith Farmers' Club by MR T. CHAPMAN SAUNDERS.

MR SAUNDERS said, in preparing land for a root crop, a good depth of soil was highly desirable, and any new system which would tend to that end, more especially on thin soils, was to be recommended. In dry seasons, such as they had just experienced, the deeper the soil, the more moisture is retained; at the same time, the keeping the best soil on the surface must prove beneficial. By ploughing deeply and bringing a poorer soil to the surface, a large quantity of rich manure is required to form one equally good as before. With that view, he thought the introduction of steam cultivation would effect great good, and he was very gratified to find that two gentlemen had been induced to speculate on bringing several sets of tackle amongst them, for hiring at convenient times. He trusted the speculation would prove remunerative to all parties interested.

On all soils good autumn cultivation was very desirable previous to the root crop the following year, but bare fallows were not always equally to be desired, from various causes. For instance, it was more necessary to fallow on strong and high and dry land than on soils of a sandy nature, where there was, perhaps, a better climate, and certainly more moisture. Lands in the neighbourhood of Wool and Burton required different management as to tillage, time of sowing, &c., from that of the hilly lands around Chaldon, a few miles distant. He had nearly always found where roots could be sown sufficiently early after a green crop on medium soils, the result had been satisfactory, and he had seen instances where roots grown after a green crop had beaten those after fallow, side by side. On cold soils the difficulty was to get the green crop forward enough to feed off early for the turnip crop to follow, and more especially swedes. One of the general causes of failure wa they did not, as a rule, sow their roots ciently early, though another reason be that which he had previously hinte that the green crops were not fed off or, as was sometimes the case in a season, the cultivation was in a bac condition. One advantage arising having roots in forward growth was th invariably grew to larger size; and season be more than unusually favoura roots so that they matured too earl might be drawn up and placed in he the field, at a cost of from 4s. to 5s. p —say about the end of November or ning of December. Of course it was es to keep the land fairly clean when sow artificials, as there was otherwise not s an opportunity for clearing after although he would at all times recon the use of the fork and a basket in s ing over the root land regularly for any quantity of couch and docks which mi found there; in proportion to the quan these weeds, would the expenses be inc from 2s. per acre upwards.

In the growth of artificials, a succ was desirable. First came rye, which be grown almost in all soils; then barley, which was not quite so certain trifolium, succeeded by vetches. M varied as to the sowing and growth folium. When first introduced, a few ago, it was considered sufficient mer drag in the seeds in the stubbles, whic afterwards rolled. He was inclined to that the land once ploughed was pref being well pressed by heavy rollers, to it thoroughly solid before sowing the s quantities of about 25 lb. per acre— more or less, according to the land an of sowing. About 1 peck of Italian ry seed could be advantageously sown abo

time, remembering that it was highly
ble to sow early—on cold soils from
iddle to the end of August was a good
The beginning of September might
·ly enough for some soils, but he pre-
sowing all in August. The difficulty
was in the harvest not being completed,
ence this was about the first thing to
tended to in such a season after the
ıad been secured in the stack. Man-
might be more extensively grown than
he case generally at present. These
een objected to as leaving the land in
poverished condition, but if they took
consideration the usual practice of re-
g them from the land to feed elsewhere,
ould somewhat account for the fact of
ng so. If only they were fed off, as
ıe invariable practice with swedes and
s, he had no doubt the case would be
fferent. The end of April was not too
in most places to sow; there were,
'er, exceptions, but very few, where
th of May might be soon enough. He
rather sow a trifle too early than
te, as after sowing mangold early they
ed, and could be stacked before the
of frost, the advantage of which could
over-estimated. He would apply the
general remarks to swedes and turnips,
ecommended them to begin sowing
and also to obtain a succession. By
sowing, he meant with the swedes in
onth of June. In a few instances they
be sown during the last week of May,
ommon turnips even earlier still. Rape
l be sown in a small quantity, if the
e ready and the weather favourable at
d of April, when the fly is oftentimes
usy than a few weeks later. For that
only, perhaps, he would recommend
sowing; though, if there was no fly,
hich was sown three weeks later would
ce a greater abundance of food. Should
rly-sown rape fail, it could be resown,
second succession crop could be ob-
later in the season. Rape, in a young
was better to the taste, and not so well
ed by stock; for this reason it should attain a certain degree of ripeness before being fed off. The greater the variety and assortment of green crops for stock—to be used at different stages throughout the season—the better. Experience too truly proved, especially in the case of swedes and turnips, that the land became "sick" by the same crop being too frequently sown; hence farmers should give attention to any new plant that was calculated to supply such a deficiency. Cabbage has been thought by some to be an exhausting crop, but after ten years' experience he had arrived at quite a different conclusion. He had invariably found the land to grow wheat better after cabbage—part carried off and part fed on it—than after turnips. He would remind them that the expense of rearing plants, including transplanting, hoeing, &c., was precisely the same for a bad crop as a good one; hence (the cost per acre being the same) the better the land was, or artificially made so, so much the better paying the yield would be. He thought, also, some misapprehension existed as to the cost and method of growing cabbage in the field. As much had been said and written on the subject of late, perhaps it would be well to state something of the systems he had adopted. In the first place, he reared his own plants, which every one who intends growing a few acres of cabbage annually should do, as by that means the expense was much less than by purchasing them, to say nothing of the advantage of transplanting immediately from the bed. Besides, they could choose the weather most suitable for the purpose, which, if stormy, was so much the better. The seed should be sown about the first week in August. If sown in July, the plants too frequently "run to seed." He was therefore inclined to attribute, in plants, their going to seed, and being regarded a bad sort, to the fact of their being sown too early. About the beginning of October these plants would be fit to transplant into a plot of well-prepared land, allowing each plant about 4 inches of space. One horse and plough was needed to turn over a small furrow, which was best raked down to make a plain surface

for the reception of the small plants, which should be set in the ground by piercing holes with a stick. A good staff of labourers, and a suitable time, should be selected for such work, so as to get it completed in a limited time. Thus the small plants should remain till the following April or beginning of May, when they could be removed, and planted out finally at proper distances, say 2 feet each way, which should be done in this manner: Having prepared the land (which is generally taken after a root crop, fed off late after the barley sowing has ended), the soil should be rolled lightly to get a comparatively smooth surface; then, fixing three times (on the reverse way), on the bar of the horse-hoe at a distance of 2 feet apart, proceed to mark lines across the field one way; then, drawing the implement across the field at right angles the other way, the plants must be set at the points where the lines cross each other, thus easily indicated; and, from the fact of the plants being in perfectly direct lines several ways, the horse-hoe would save much labour in hoeing by going first one way and then across in the other direction a few days later, as might appear desirable. Thus the cost of hand-hoeing was reduced to a minimum. About 11,000 plants per acre would be required to place them at what he found a fair distance—viz., 2 feet apart each way. Method was essential in the distribution and economy of labour in planting cabbages, not less than in many other branches of farming pursuits. He found the following the best plan to follow: First, form a company of three men, each taking a separate line across the field; one boy or woman, had work enough, and not too much, to drop the plants, one at each mark indicated. If another company could be formed similar in number, so much the better, but it must act quite independently. A lad, not quite equal to planting, might be usefully employed in placing baskets filled with plants at easy distances for those who dropped them, and also in removing empties. He preferred placing plants in baskets when drawn from the beds, as they suffered little damage in that manner, compared with what they might if thrown into a cart; it was also easier to carry them into the middle of a field, walking on the land already planted, so as not to disturb the crossing marks. The cost of carting the plants, say one-eighth of a mile, and planting on this system, would not exceed 5s. per acre altogether. It was better to plant out finally in spring, rather than in autumn, as the risk of damage by game, rabbits, wood-pigeons, and severe winter was lessened. A deviation from the four-course rotation was necessary to grow cabbages well; in this respect, as well as many others, that system would be more and more condemned as time passed and circumstances altered. Other systems, providing that not more than one-half the land be sown to corn in any one year, might be advantageously introduced into future agreements between landlord and tenant. He had dwelt particularly on the preparation and planting of root crops, believing them to be the foundation of all good farming, at the same time a very expensive part of it. Hence it should be their aim, if possible, to grow healthy and sound crops as well as large ones. Experience had taught them that whatever might be the system, the less often the same kind of crop followed in its turn the better. He should not detain the meeting with any lengthy remarks on preparation for wheat, but would say that on light soils it was better to allow the autumn rain to fall before ploughing, if practicable. On strong soils the case was different. He had not found a stale fallow so desirable for wheat as for roots, which latter grew much better on early-ploughed land. Early sown wheat, say in October, required less seed, and might be deposited nearer to the surface than if later sown, which must necessarily be deposited deeper as a protection from frost. In the spring, harrowing did good, and, by rolling, thin wheat was improved, and thickly sown wheat was also strengthened. At that time it might appear to do mischief, but it was not so eventually. He was not sure that top-dressing to a very great extent paid—that was, at the present time, and with the average price of wheat in late years, when manures had become dearer and wheat had declined in value. There were, however, some ins where he would recommend the use dressing. Barley, to use an old saying, be sown in dust, and he believed the still held true. March was about the me to sow, but occasionally earlier if a rface, if desirable, was easily obtained. 3 to 3½ bushels per acre were gene- ufficient. Some used more, but he t very often unnecessarily. In con- , he would only add that experience ught him that land well cropped was eeded. If land was not properly by artificial means, the natural plant soil (seeds of which existed in abund- erywhere) would very soon spring up to ny deficiency arising therefrom; therefore, it was well to sow sufficient seed. Very great losses, too, occurred annually from sowing bad seeds: he meant old varieties as well as from ill-assorted stocks. If in animals "like produces like," why did not the same law of Nature hold good in regard to plants? He said without hesitation that this branch of their business did not receive that amount of attention which its importance in a pecuniary sense merited. Good tillage, and doing everything at proper seasons as far as possible, having a due regard to expenditure, must add to the success of agriculture, and the supply of the greatest amount of food to meet the wants of an increasing population.

STEAM CULTIVATION.

Paper read before the Wisbeach Chamber of Agriculture by Mr Isaac Robinson.

AM cultivation has of late years ccupied much of English thought, mechanical skill, and ingenuity. is no subject connected with agri- which has a greater interest in the day, because, in the judicious em- nt of steam in breaking up the soil, k for that which will increase the of farming, while it decreases its ex- re. For the progress that steam de in other fields of labour, look at tion. It is less than fifty years since Stephenson opened the Stockton and ton Railway, the first line used for er traffic, and already the whole is covered with a net-work of iron d 10,000 locomotives convey goods ssengers over thousands of miles of railway. Look at our workshops. condensing engine of the last century a numerous progeny. It is calculated m 180,000 to 200,000 steam engines are ed at present, as the motive power of ls, mines, and factories. Look at our nd rivers. We have men among us ere alive when the shrewd Yankees sneered, in 1807, at "Fulton's Folly," as the first steamboat was called. Now we have steam-vessels innumerable, from the tiny tugs and penny boats of our rivers, to the noble Captain (whose loss we are now deploring), or the gigantic Great Eastern; and our gallant merchant ships visit every port and traverse every ocean of the globe. We can also look at our farms. In 1841, the first portable engine was exhibited at Liverpool as a great curiosity. We have now about 14,000 threshing engines in daily use amongst us. Such vast advantages have been gained by steam, as a motive power, in other branches of industry, it is no wonder that attempts were made from time to time by energetic and persevering men to adopt the new power to the cultivation of their land. I will mention a few of the early pioneers. In 1832, Mr Heathcoat, of Tiverton, patented a set of steam cultivating machinery, which, I believe, began to work in 1834. This did not prove a success. In 1830, a Mr M'Crae patented a system similar to Mr Heathcoat's, but being intended for the low level lands of British Guinea, where many fields are bounded by parallel canals, the engine and pulleys were placed in punts at opposite ends of the field, which were moved on as the work progressed. In 1846, Mr Osborn, of Demeura, ploughed with two engines, one at each end of the field. In 1849, Mr Hannan used iron wire rope for steam culture. In 1851, Mr Wren Hoskyns, in his amusing *Chronicles of a Clay Farm*, brought forward his theory of making a seed bed in one operation, and thus dispensing with the successive processes of ploughing, harrowing, and rolling, &c. Taking his idea from the claws of a mole, he proposed that a traction engine should drag behind it a set of discs armed with revolving claws, which should rasp up the soil and leave the land behind it in the comminuted state of a mole hill—a perfect seed bed ready made. The fruit of this book was a perfect crop of patents, and many ingenious machines were made to carry out the theory — such as Romaine's cultivator—but the inventors did not take two facts sufficiently into consideration: 1. Freedom from weeds, and atmospheric influences; 2. To move a heavy traction engine over rough ground takes up so much of its power, that it has little to spare in dragging an effective cultivating implement behind it. I submit this last fact to the consideration of those who are inclined to believe that the traction engine with india-rubber tires can drag a plough more economically than it can be hauled with wire rope.

THE LATE MR JOHN FOWLER.

The late Mr John Fowler was one of those remarkable men possessing all the qualities of a great inventor, skill, ingenuity, indomitable energy, and perseverance. I think I have heard that he spent three fortunes in perfecting his invention, and he died in the prime of life, leaving his representatives to reap the fruits of his active and persevering exertions in a large and ever increasing business. In 1854, Mr Fowler exhibited at Lincoln a draining plough worked by steam. In 1856, he shewed at Chelmsford his well-known balance plough, worked by a stationary engine on the roundabout system. In the year 1857, the Highland Society awarded him the £200 prize, as having found an economical substitute for horse power. In 1858, the judges of the Royal Agricultural Society at Chester awarded the £500 prize to Mr Fowler. It was on this occasion that steel-wire rope was first used, and from this dates the economical commencement of steam cultivation. Since 1858, Fowler's tackle has received upwards of £3000 worth of prizes at the different shows where it has competed, each year shewing an improvement in some detail. Twelve hundred hands are now employed at the Leeds factory, in a trade which, I believe, is now only in its infancy.

MR WILLIAM SMITH.

After John Fowler, I would mention to you the name of Mr William Smith, one of the fathers of modern steam cultivation. He is a farmer at Woolston, Bucks, and his occupation is 200 acres of heavy land, or less. Having become convinced of the superiority of cultivating over ploughing, by reasons I propose to mention presently, he invented his cultivator (which was made under the superintendence of Mr Fowler), and in December 1855 he began steam cultivating, with a 7-horse portable engine, and smashed up oat, pea, and wheat stubbles with satisfactory results. Mr Smith's system has not been greatly altered since its introduction, and is in common use on hundreds of farms. The engine and windlass are fixed in one corner of the field, round which field the rope runs, carried on rope porters, and the cultivator is hauled between the shifting pulleys at each headland. At the Chelmsford Show, in 1856, Mr Smith competed for the prize, but although the work was fairly done, the judges did not consider it more economical than horse labour. Mr Smith did not exhibit at Salisbury, but made his appearance again at Chester in 1858, by his manufacturers, Messrs Howard, of Bedford, who have since conducted the manufacture on their own account. Messrs Howard cultivated the land assigned to them in good style, and the judges awarded to them the large edal of the Society. Mr Smith since ne has shewn no inclination to hide his under a bushel; he has published lets and letters, and delivered speeches erable; but if he has viewed his own ions and practice with somewhat too able an eye, and those of other inventors ome amount of prejudice and distrust, ist remember that he has used steam tion for nearly fifteen years, that all me his farm has been open to the in- on of all the world, and that he has ible to give the plainest practical evi- of the profitableness of steam tillage, ius fairly earned the gratitude of his r farmers, and of the community at

Since 1858, Messrs Howard have l many prizes for their steam cultivating nery, and have made many hundred f tackle, principally on the roundabout i advocated by Mr Smith. I am glad ice, however, that they now adopt also rect system of Fowler, cultivating with tion engine on each headland, certainly iost economical method of applying where it can be adopted. It is notice- also, that since 1858, Messrs Fowler 'o. have manufactured many more cul- rs than the ploughs with which they won hester prize.

DVANTAGES OF STEAM CULTIVATION OVER PLOUGHING.

er this sketch of the introduction of cultivation, let me call your attention ne of the practical questions of my sub- First, the advantages of cultivating ploughing. At certain times of the year farmer is glad to employ a cultivator, er, or scarifier, and acknowledges the it of doing so; but the obstacle to their extended use is to be found in the fact very effective implement of the kind is or less of a horse-killer. I will read you xtract from Mr Smith's letter to Mr es, 1856. "The most approved of our ion ploughs simply and absolutely turn he soil, placing the former surface from 6 inches below, and bringing up the th surface of the under soil to the top. By this process all the seeds, weeds, and roots are deposited below the surface; whence the weeds which are propagated from roots or layers—such as couch-grass, water-grass, crowfoot, coltsfoot, and others, being divided by the plough are indefinitely multiplied, and do in fact, after four or five years, become increased to so great an extent as to render it absolutely necessary for the farmer to leave his land practically barren for the purpose of removing these obnoxious weeds; to do which the plough entirely fails him, and he is driven to the scuffler, cultivator, or other implement which he has invented for this purpose. Roots, also, of the thistle kind, spread horizontally just beneath the pan which is trodden down by horses, and unless recourse be had to subsoiling, can scarcely be eradicated at all." Mr Smith not only invented an efficient cultivator, but he made it take the place of the plough for all operations, except ploughing in clover layers. Ever since '56 he has stuck to his text, with these results: his farm is as free from weeds as a garden, his crops have increased, and his land is cultivated at much less expense than before. Wherever steam culture is used, ploughing is used less, and cultivating more than before; for we find by experience that by cultivating you can destroy weeds better, work your land deeper, and leave it in a more productive state. Let us now consider some of the advantages of steam cultivation. 1st, It deepens the soil. There are thousands of acres of good land in this and nearly every other county of England that have never been ploughed more than 4 or 5 inches deep. Year after year, the plough slade has ridden over the subsoil and the hoofs of the horses have trampled it, until it has become a solid pan, effectually preventing the roots from penetrating or even the water from passing through it—in fact the subsoil has become "puddled clay," like the bottom of an artificially made pond. Now, modern farming condemns this; and many good farmers make a practice of subsoiling their land two furrows deep, once in every rotation, in spite of the expense; but steam does this more effect ly and much cheaper. I could point out to land in this neighbourhood which had grown nothing for years until it was steam cultivated, and it then, and since, has produced most luxuriant crops of wheat and oats. Mind, we do not want the raw clay brought to the top, and the good soil and manure buried 5 inches below it, but we want to keep the good soil at the top, freshened with a slight mixture of subsoil, and we want to smash up the solid pan, letting the surface water down by the drain, and exposing the heavy subsoil to the combined influences of sun, air, rain, and frost, so as eventually to make it good soil, fertile and productive. What becomes of those large lumps of clay left on the surface where draining has been going on? Atmospheric influences pulverize them, they mix with the neighbouring soil, and, so far from injuring, they actually improve it—so is it with the portions of the subsoil brought up by the cultivator. To get the full benefit of steam cultivation, it is, however, necessary that clay land should be broken up when dry, or it soon consolidates again, nearly as hard as before. I confidently look forward to the time when deep cultivation will be the rule, and not the exception in this country. The second advantage I claim for steam-cultivation, is expedition. You can break up your land more quickly than by horses, at a time of the year when time is money. I have often seen a good crop on a field which could never have been cleaned and sown that season, had it not been for steam power. But steam not only thus helps the backward farmer, but it prevents a man thus ever getting behind. Look at the advantages of steam cultivation—are they, even now, estimated as they ought to be? I say, fearlessly, they are not; we should not see such a quantity of stubble land unbroken in October. It is directly after harvest, when the sun is hottest, when the land is driest, when the weeds are most easily destroyed, when you can give a half-fallow to your land, when one day's work is worth a week's labour in the spring, it is then that the land wants breaking up. I believe that a farmer who buys extra horses for this work does wisely. But by the steam cultivator you can smash up 10 to 30 acres a-day. The steam-horse wants no rest, you can work him from sunrise to sunset, you can even work him by night if you have hands enough to manage him, as Mr Campbell has done by the use of the magnesian light. People speak of the great expense of steam cultivation; the question is, can we properly estimate the value of work done at such a time? A reaping machine costs a great deal of money, but if you can cut 12 acres a-day with it, when your wheat was all ripe together, how trifling, in comparison, is the outlay? On many farms whole fallows have been done away with by the use of an autumnal steam cultivation, and the land, nevertheless, kept quite free from weeds. The third advantage of steam cultivation is, that it improves drainage. On ill-drained land, especially where the subsoil is a horse-trampled pan, the rainfall runs off the surface by grips and water-furrows, into the ditches, and thus its valuable chemical constituents are lost to the soil: nor is this all: the water which is retained and cannot get away, stagnates and keeps the land wet, cold, and sterile, while on well-drained land, when the pan has been broken up and horses kept off it, water-furrows are unnecessary, the rain filters through the thirsty soil to the drains, leaving most precious manure behind it. The fourth advantage of steam cultivation is, that on heavy land you save those 350,000 hoof-marks they tell us horses leave in every acre of land ploughed. When your clay land is dry, it is too hard to plough; when wet, the weight of the plough and the trampling of the horses poach the subsoil into the pan we have spoken of. But the steam-hauled implement leaves no mark behind it, and in unfavourable seasons, when you cannot get horses on the land at all, you can still use steam. The fifth advantage in using steam is, that you are able to work a farm with less horses, and spare the horses you keep for the hardest work. Substitute steam labour, and you save not only the difference of their keep for the few weeks, but for the whole year. Supposing that by the partial use of steam you can save four horses' keep—at Mr. Morton's estimate

ould amount to £184. Some people
saved much more than that. The
.dvantage of steam cultivation is, that
use the land requires less working
ewer operations, such as ploughing,
ing, rolling, clod-crushing, &c. Even
used occasionally, steam cultivated
s easier to work for years afterwards;
the full benefit of steam be obtained
land broken up at the proper time,
ot a horse-hoof allowed to trample
oach the land afterwards—if steam
d continually, and not occasionally,
e light operations of the farm every
as well as for the deep cultivation
four years, the saving would be enor-

The seventh advantage of steam culti-
is, that it improves the position of the
ltural labourer: it enables a man to earn
wages for himself with less toil, and to do
r day's work for his master; it quickens
ce, and makes a man more handy, smart,
, and self-reliant. The eighth advan-
f steam cultivation is, that you can get
crops at less expense, and that the fer-
f the land is increased by it. By deep cul-
n and good drainage the temperature of
nd is raised, the land dries quicker in a
ason, and in a dry season, like this year's
er, it remains moist, and does not parch
the blazing heat of the sun. Liberal
e does something no doubt, but the
secret is in spade cultivation, by which
nd is kept free from weeds and open to
h fertilizers contained in every breeze
every shower of rain. That it is not
anure, look at the Lois-Weedon system
wing wheat. You know that by a strip
low between every three rows of wheat
nay grow a good crop of wheat for
y years in succession if you will, without
deful of manure, and then have the land
good a condition as ever. What is the
? Only that the land has been kept open
eive Nature's bounty. I have not gone
he question of the peculiar advantages
am cultivation on light land, because in
eighbourhood our land is principally
, or else in small fields; but I will say,
, that where the enclosures are of good size, as in parts of Lincolnshire and Norfolk, steam has won triumphs as signal as any of those gained on heavy soil, and is of equal value to the farmer.

OBJECTIONS AGAINST STEAM CULTIVATION.

I will notice some of the objections urged against steam cultivation, and some of the obstacles to its progress, and then briefly consider how the objections may be met and the obstacles removed. Objections against buying tackle: Want of capital, want of mechanical skill, the example of those who have tried it and not succeeded, the difficulty of getting men to manage the machinery, the risk of breakages, and the cost of repairs; against buying tackle in partnership, there is the possibility of all the partners wanting it at the same time, and the additional difficulty of managing men who have to serve several masters. Objections against hiring: Farmers cannot sell part of their horses, because they cannot be sure of getting tackle when they want it; and having horses enough to do their farm work, hiring steam is an extra expense; and then, you know, contractors charge such high prices. General obstacles: No leases, want of tenant-right, fear of disturbance or increased rent, bad leases compelling a certain rotation of crops, or forbidding the use of the scythe or reaping machine, timber in fields and hedges, bad roads, small fields, crooked hedges and ditches, want of draining, bad water, want of water. My answer to these objections is this: That any energetic young farmer who will give his mind to it, may soon acquire enough knowledge to drive an engine, and to see that his men keep the machinery in order. Such a one will have little difficulty with either men or machinery, and for him £700 to £800 laid out in steam tackle will be an investment that will pay him tenfold, as it has done hundreds of practical men. As to hiring, if you make a bargain beforehand with a contractor, you are certain of getting tackle when you want it, and can thus get rid of the extra horses As to the high prices charged, the great point to be considered is, whether the value of the work done is worth the money, all thi considered. Competition brings all prices to a fair level. If the trade be profitable, contractors will be multiplied; if unremunerative, they will soon be starved out. But it is evidently to the advantage of the steam-employing community, that the men who spent their time and capital in order to bring steam cultivation within the reach of the smallest occupier, should be able to live by their business. Let farmers only prepare their farms properly for steam cultivation, and offer a good breadth of land, and they will be surprised how cheaply and eagerly contractors will work for them. How, then, is a farm to be prepared for steam, to get its full benefits? For this, landlord and tenant must unite and work together. In this district we suffer principally from two great hindrances—brackish water, which destroys an engine's fire-box in two seasons, and small and irregularly-shaped fields. In time, however, pits will be dug, and tanks made to retain that valuable rain-water which we now waste so carelessly. Mr Torr, of Aylesbury, and others, for example, have filled up open ditches, laid pipes instead, and conducted these mains into corner-tanks, where two or three fields meet. Fields of 30 to 100 acres will be the rule, not the exception; and their boundaries will be straightened. New farm-roads, straight and good, will be made, on which engines can stand when at work. Trees and other obstructions will be removed. A knowledge of steam cultivating machinery will be deemed as essential a part of a young farmer's education, as the rearing of stock or the rotation of crops; and the next generation of farmers' sons will compete for silver cups at the local shows for steam cultivating, instead of ploughing.

DISCUSSION.

Mr WALKER wanted to know what sort of steam cultivation farmers should use—the single system or the double system? He maintained that every farmer ought to have a steam apparatus upon his premises. As Mr Robinson had fully observed, however, it required a mechanical mind to work a steam engine and to work the tackle. Men, as a rule, are not acquainted with the working of such machines, and he had found great difficulty in getting men who would keep to the work. The boys, he thought, became the best men for that sort of occupation. He had boys in his employ whom he taught all they required of farming operations, and when they had gained the necessary knowledge he gave them 3s. a-day, and some of them earned a guinea a-week. There is one thing they had to contend against in steam cultivation, and that is prejudice, but that would die away; everything that is right would succeed in the end. His opinion was, that every large farmer ought to have an engine and tackle of his own.

Mr ROBERT DAWBARN said, at a meeting of the Society of Arts in London, he remembered it formed a matter for discussion, what effect the introduction of steam cultivation had upon agricultural labour. They had returns sent from about forty English and Welsh counties, and some from Scotch counties. The effect of it was found to be, not as had been expected, but that steam cultivation was very much to the advantage of the agricultural labourers. One of the most unfortunate counties in England for agricultural labourers is Wiltshire, where the labourers get only 7s. a-week. The result of the introduction of steam-cultivation into that part of the kingdom was that the labourers' wages were increased 2s. per week. The introduction of steam cultivation into other parts of the kingdom had been followed with a like beneficial result. This, he thought, would remove from every kindly heart the feeling that an impediment was caused by the introduction of machinery, owing to the disarrangement of labour it caused.

Mr CATLING said there are one or two points in Mr Robinson's paper, which struck him as being rather faltering. He had stated that, by the ordinary system of horse-ploughing, land was rendered barren every fourth or fifth year, and that by steam cultivation the fallow was rendered unnecessary. He would conclude his remarks by proposing the following resolution :—"That the application of science and capital is greatly restricted by covenants which limit the use of land, and advance of the cost of labour, and lowering of the range of corn prices, and the power to induce agents to consider greater freedom of management."

Mr RUSTON presumed that a man would not buy a large engine, and work on the direct principle if he had only a small farm. The next question for consideration is whether the roundabout system is better to use, and in what particular instance the one is superior to the other. He could not help thinking that the roundabout system is the best where a man purchased his own tackle and did not hire, because then he could use his engine when the weather was favourable; whereas, if he hired it, he would have to put up with inconvenient weather, during which the engine would remain idle. The great object they had in the application of steam is to benefit the land, and there is no doubt that steam cultivation is double and treble the value of ploughing. The steam cultivator turned everything up out of the ground, and at the same time exposed the earth to the advantage of ieric influence, and also enabled it to be en- y the sunshine and the rain. He did not ad- deep cultivation at once, because they might much of the fertilizing element; the ground be cultivated deeper and deeper gradually. iston concluded by stating the satisfactory that had followed steam cultivation on his nd, and that he believed steam cultivation be much more extensively used than it is at sent time.

LLARD would like to know the cost of steam and tackle, and the cost of employing them ? He thought the resolution that Mr Catling posed should be supplemented in some way, in its present form it would leave no practical the mind of anybody.

ATLING said he was thoroughly convinced that d by steam cultivation could be made com- ly good, and that they could apply the system so ably represented in Mr Robinson's paper. ed the result of their discussion would be that uld arrive at some practical result, and that uld induce gentlemen of large influence to give consideration to the matter.

WALKER, in reply to questions put to him, hat the cost to him of steam cultivation was s. an acre if only ploughed one way; but he d his land two ways, therefore it cost him 8s. . The engine he reckoned cost him about 6s.

OOKER asked Mr Walker if he would let the for 6s. a day, and he replied in the affirmative, that he would let Mr Looker the engine for 6s. a-day now for three months. Mr Looker answered that he would have it, and would send for it to-morrow.

The CHAIRMAN observed, that at the adjourned discussion he thought they could take into consideration whether steam cultivation is everything, and steam ploughing nothing, and he hoped, too, something would be said in favour of the cart-horse so as to shew that the cultivation could be done by the cart-horse as cheaply, if not as effectually, as it could be done by steam cultivation. He would be very glad to see those present attend the adjourned meeting, because he thought the subject is one of very great interest. They had not yet had a meeting out of Wisbeach, and therefore he proposed that the adjourned meeting should be held at the Griffin Hotel, March, on the 24th of November next.

Mr ISAAC ROBINSON said, in reference to the maintenance of a horse, that the estimate was quoted from a report by Mr J. C. Morton. That included the cost of everything in connexion with the animal, the cost of harness, the wages of the man to look after it, &c. He should not like it to go forth that he meant it would cost £46 a-year simply for the keep of a horse.

Mr W. C. LITTLE said it would be very necessary for them to know the cost and the expense of the work which had been spoken of. His own experience was very different from that of Mr Walker. The cultivation of his land cost him 30s. an acre, which was very different from 8s. an acre.

A vote of thanks was, at the close of the meeting, passed to Mr Robinson.

HOUSING STOCK IN WINTER.

IERE can be no question that in such a rigorous and changeable climate as shelter for stock during six months of ar, from the 1st November to the 1st is absolutely essential to ensure their and healthiness.

rranging the yards and buildings, how- to that end, there are some important that seem to be too generally over- l by our farmers. One of these is the ng and locating them so as to arrange e different classes of stock do not in- , to the injury of one another. If are bred on the farm, the colts need l yard for exercise, with comfortable sheds fitted with feeding racks, to run into at nights and stormy days. The young cattle need a separate yard and sheds with racks to themselves, where they will have room to move about, and not be kept in continual fear of the old cows and oxen, which should be kept separately in their stalls. Sheep should never be among other stock, but have large yards with good sheds open to the south, if open at all. In any case, buildings that are used for young stock or sheep must be constructed as to allow of good ventilation at all times when necessary.

Another point often neglected, is the supplying light to animals that are kept in close confinement most of the time. We have frequently observed that horses kept in dark stables are always more subject to shying when they are driven out, than those that have well lighted stables. One can easily conceive that a horse brought out from a dark stable into the bright glare of a winter sunshine is partially blinded, and, in fact, we believe much of the blindness common among horses is caused by constant sudden exposure to light every time they are taken out of their stables. Nature has given light as one of her blessings conducive to health, all creatures having the organ of sight largely developed, and to deprive any of them of the means of exercising that faculty is sure to result disastrously in some form or other. It is noticeable how much less shying there is among horses in the summer than in winter, which is probably due to their being more out of their stables during that season, and even when in their stalls the doors are left open during the day time.

Still another point is that of constant cleanliness, both inside and out of their shelters. We believe much of the diseases prevalent amongst stock in winter can be traced to the want of cleanliness and pure air. Every yard and shed should be kept well covered with clean straw, and every stable and byre so arranged that the stalls and floors can be readily cleaned out, and the animals kept from accumulating filth on their bodies. What else could be expected than a general unhealthiness and want of thrift in animals, that are living in an atmosphere that is constantly impregnated with bad odours and impurities? Let the stables and byres be well dried during the day, when it is not excessively cold or blowing snow drifts, by leaving doors and windows open for several hours. In the case of animals being fed up for the butcher, it may not be objectionable to keep them in partial darkness, in order to induce them to lie down and keep in a state of rest as much as possible; but with all others there should be a good supply of light allowed during the greater portion of the day, and if the cows can be turned out of their byres by themselves, for a few hours each fine day, they will enjoy better health.

Lastly, we too often see that the amount of space allowed for winter quarters to stock is altogether too small for their comfort; yard room, especially, is often very much cramped and confined, as if the land on a farm was of as great value as that in a city. It is better to have yards of good size, and, after clearing them of the winter's accumulation of manure, in spring plant them with cabbages, beets, mangolds, or carrots, reserving only the stable yard for summer use.

The amount of stall room allowed is also often far too small, and the animals are crowded together in such a manner as to make them feel anything but comfortable. The idea of carpenters and builders, who generally put up the stalls, seems to be to make them all of one uniform size, the dimensions of which are dictated by some arbitrary rule or caprice, whatever it may be called. They do not seem to think the size of the stalls should vary, so as to accommodate different sized animals, but that, like the bed of Procrustes, the same space should fit all comers. It seems to be overlooked that the stalls or spaces set apart for each beast may just as well be either all of such a size as to accommodate comfortably the largest ox, or be graduated in size in order to economize space, and yet give comfortable space for the animal to occupy it, according as it is large or small. The more ease and comfort the stock can obtain when tied up in their stalls, the more contented they will be, and the better they will thrive.

Papers by Tim Bunker.

LVIII.—TIM BUNKER ON THE FOOD QUESTION.

KNEW we should catch it to-day," said Seth Twiggs, as he came into use on the evening of Thanksgiving and, seating himself comfortably upon ttle, blew a ring of smoke out of his , as if it had been shot out of a rifle.

Parson ginerally hits the nail on the and hit it square to-day, and no mistake. ave sent off too many of our boys to ity. There isn't so much breadstuff in Hookerton as there was fifty years d if it keeps on at this rate, somebody t to starve by-and-by."

at is to say, if every place is just like rtown," I responded.

ghbour Twiggs' remark had reference Spooner's Thanksgiving sermon, which etty much like all his sermons, whether days or not, "a word in season." You r Spooner, like myself, belongs to the ool of folks, who have got so accus- to making up our own minds on public ns, that we can't afford to take our ns second-hand. You see, most people here have got a dreadful hankering ity life and fashions. They want ing better than farming for their sons aughters, though, according to my farming, taking the long run, pays than any other calling upon the face earth. The boys that grow up around e smart, and would probably do well at anything, if they had a fair chance. But rtown can't hold 'em any more than a hold boiling water. Some of them one down south to try their fortunes, the west, but more to the city, which ns to swallow up the country, which d deal like a man swallowing his own h. You see, this state of things makes rather a dull look for the old parish, and worries the minister, and it works out in his sermons on Thanksgivings and Fasts, and sometimes on Sundays. Some grumble about political preaching and secular preaching, &c., but, for my part, if a man has got any thing to say to make folks better, I never could see why it was not just as well to say it on Sunday as any other time. But the grumbling doesn't trouble Mr Spooner much. He's as independent as a wood-chopper, and knows he can get his bread and take care of himself, if the Hookertown people turn him out of the pulpit to-morrow, which they have no notion of doing. He speaks right square out, and nobody has any more doubt as to which side of a question he is on, than they have about sunrise.

Well, you see this food question is what the philosophers call a poser. If bread and meat are all the while getting dearer, and labour is growing cheaper, and that is the settled tendency of society, you see the time is coming when the labour won't buy bread, and somebody must perish. That is the way things are working now, and wise men should be looking for a remedy.

Mr Spooner shewed this very clearly. It has been the tendency in Europe for a great many years—England hasn't raised her own breadstuffs for more than thirty years. The great mass of her people are gathered in cities and large manufacturing towns, and there is not land enough left to raise a full supply of food for her population, even with their improved husbandry. She has to bring large quantities of wheat and other grains from the ports of the Mediterranean, and from across the Atlantic, to make up the deficiency. Now, if there should be short crops in these countries and in America, or if she should be at war with enemies strong enough to blockade her ports, nothing could prevent great distress and starvation.

The pith of the discourse was, that Hookertown was the centre of the universe, that farming was the best business, that those who were engaged in it should be content with such things as they had, and be thankful for them. He had some sly thrusts at clam-shell bonnets, silks, satins, and ribbons, fast men and fast women, and the general extravagance of the times. These, I suppose, were meant as sauce for the Thanksgiving turkey, and to help digestion.

"Well, Squire, what are you going to do about it? Food is getting higher every year, and labour doesn't keep up with it. The rich are growing richer, and the poor poorer. What are you going to do about it?" asked Seth Twiggs, as he knocked out the ashes of his third pipe and loaded again.

"Well," said I, "I am not going to whine about it. Of all remedies for a great public evil, that of whining is the poorest. I have faith to believe that there is some way of deliverance from this and all other social evils. The high price of food is not going to last for ever.

"All that Mr Spooner says is as true as preaching. Things are a little unsettled just now, but they will come right after awhile. I have noticed that there is a tendency in Christian society to correct its own evils. Sometimes we have an outbreak of burglaries, bank robberies, and shop-lifting, and it seems as if society was going to ruin. But when the people get wakened up, and a few of the thieves are convicted and sent to prison, the times improve wonderfully. People are not going to live in miserable tenement houses, and suffer all the miseries of city poverty without learning something. I have noticed that many who go to the city, do not succeed there, and come back again wiser, if not better men. They find that their genius does not lie in the direction of trade, but they have a decided tact for making corn and potatoes grow. They support their families comfortably, and, on the whole, are no worse for their city experience. Then, I have noticed again, that a good many who succeed in the city acquire a competence, and before they are spoiled, retire to the country to lead an industrious rural life. They become large producers of breadstuffs, and supply the city markets with fat cattle, sheep, and swine. They rejoice in their well-tilled farms, and in their flocks and herds. Then, again, I have noticed that some of our very best small farmers and gardeners are city bred people, tradesmen or mechanics, who, from failure of health or disgust with the city, come into the country, near good markets, to support their families from the soil. They have thrifty habits, some capital, and succeed admirably by making the most of a little land. Thousands in these ways are changed from consumers into producers, every year. If multitudes flock to the city, multitudes come back to the country.

"And then there is a growing tendency among our city people to scatter themselves in the neighbouring towns. A large part of the men who do business in the city, live out from 5 to 20 or 50 miles in the country. Some have small homesteads, but they are all to some extent cultivators, and draw a part of their support from the soil. And this tendency is on the increase, and will grow with the increased facilities for travel that every large city is making for itself. This will not only help to unburden the city, but will add to the production of the country, and help to make food cheaper."

"I shouldn't wonder if we had Londoners living in Hookertown, yet," said Seth.

"Stranger things happened," said I.

"I shall beat them on cabbage tho', if the smartest of them come," said Seth, with an extra puff.

"It takes Dutchmen for cabbage. You should not brag," I continued.

"Then there is another thing in connexion with this food question, which I have thought of a good deal. No man has begun to conceive of the great change which our improved farming tools are destined to make in the productiveness of human labour. A man is multiplied tenfold. The horse reaper and mower mean cheaper grain and cheaper meats of every kind, that consume hay and grain. Every year is adding to these improved tools, and extending the fields of their usefulness. They come very slowly into use, but they are certainly coming; and they cannot fail to do two things—to make farming pay better, and to cheapen the price of food. A vast deal of brain power is lavished upon these inventions, and it will have its reward in relieving the sweat of the brow.

"And then when steam gets into the field extensively, as it must, what may we not expect in the way of cheap bread and beef?"

"May I be there to see!" exclaimed Seth, rising to go. "That is what other folks will do about it;—but what do you mean to do about it, Squire Bunker?"

"Do?" said I. "Why, I'll stick to the old farm, set my neighbours a good example, and die in the furrow. And if that ain't enough, I'll blow my trumpet at once, and set all the people from Maine to Texas thinking on the food question."

"Good!" said Seth, as he went out. "One of the best tools yet out, to make bread cheap, is the newspaper. I believe in brain manure."—Yours to command,

Timothy Bunker, Esq.

Among the Tombs.

JUST now there is a great outcry against the enclosure of the New Forest, and not without reason; but two centuries ago, that which is now condemned was regarded as excellent husbandry, as will be seen from the following extract from "Systema Agriculturæ:"—

OF THE GREAT BENEFITS AND ADVANTAGES OF ENCLOSING LANDS.

Enclosure with a good tall Hedge-row, preserves the Land warm, and defends and shelters it from the violent and nipping Winds, that generally nip and destroy much of the Corn, Pulse, or whatsoever grows on the open Field or Champion Grounds, and preserves it also from those drying and scorching Winds more frequent in hot and dry Springs, much damaging the Champion Lands; It much preserves that fertility and richness the Land is either naturally subject unto, or that is by the diligent care and cost of the *Husbandman* added. It furnisheth the Owners thereof with a greater burthen of Corn, Pulse, or what ever is sown thereon; Also where it is laid down for Meadow, or Pasture, it yields much more of Grass than the open Field Land, and the Hedges being well planted with Trees, afford shelter and shadow for the Cattel both in Summer and Winter, which else would destroy more with their feet than they eat with their mouthes, and might loose more of their fat or flesh in one hot day than they gain in three cool days; and affords the industrious *Husbandman* plenty of Provisions for the maintenance of Fire-boot, Plough-boot, Cart-boot; and (if carefully planted and preserved) furnishes him with Timber, Mast for his Swine, and Fruits for Cider.

It is one of the greatest Encouragements to good Husbandry, and a good Remedy against Beggery; for it brings Employment to the poor, by the continuall labor that is bestowed thereon, which is doubly repaid by the fruitful Crop it annually yieldeth, and generally maintains treble the number of Inhabitants or more than the Champion, as you may easily perceive if you compare such Counties and Places in *England*, that are for the most part upon Enclosure, with the Champion, and Chilterne Counties or Places; And compare also the difference of their manner and condition of Living, and their food and Apparel, *&c.*, it must needs convince you that Enclosure is much to be preferred above the Champion, as well for the publique as private advantage. Our Predecessors were very sensible of the difference, as appear by what ingenious old *Tuſſer* (who took upon him Husbandry in E
the Sixth days) ſaith in his *Rythms* in his Comp
between *Champion*, *Countrey*, and *Several*.

T'one barefoot and ragged doth go,
  And ready in Winter to sterve;
When t'other ye see do not so,
  But hath that is needful to serve.
T'one pain in a Cottage doth take,
  When t'other trim Bowers do make.

T'one layeth for Turf and for Sedge,
  And hath it with wonderful suit,
When t'other in every Hedge,
  Hath plenty of Fuel and Fruit;
Evils twenty times worser than these,
  Enclosure quickly would ease.

In Wood-land the poor men that have
  Scarce fully two Acres of Land,
More merrily live, and do save,
  Than t'other with twenty in hand;
Yet pay they as much for the two,
  As t'other for twenty must do.

The Differences also, and the Profits the
plainly to be discerned and proved by the Sev
enclosed Parcels of Land that have been
taken out of the Field-land or Commons,
much they excel the other, in every respect
of the same soyl, and onely a Hedge betwe
what a yearly value they bear above the othe

And also by the great quantities of Lands t
within our memories layen open, and in com
of little value, yet when enclosed, tilled,
ordered, have proved excellent good Land,
denly repayed the present and greatest ex
cident to Enclosure.

Of all which, and many other infinite
Contentments, and Advantages that Enclosu
above the Champion and Field-Land, were
sensible who so much affect and conten
Champion, &c., they could never be so bru
persist in so injurious and unthrifty a metho
bandry, both to themselves, to their neighbo
poor, and to the Commonwealth in general.

BEST METHOD OF FATTENING PI

Mr Robert Davis, in the *Museum*
of date 1764, gives the following wri
regard to fattening pigs. It will
that a hundred years ago the advan
cleanliness were recognized.

chotes* of the same litter and weight in yes for fattening; give each the same peas, meal, or whatever food it be; make ce but in the quantity of water given. r instance, dame's pig has a gallon a-day, ut 2 quarts, or in proportion to a larger lame's pig will be considerably the fattest t, but mine will be the best and firmest at quantities of liquids extend the vessels n and beast; and a due, but not over, of water is a necessary consideration for vould have good bacon or pork.

gar saying, that hogs delight in dirt; they t the hog that is kept clean, and feeds the wholesomest and best meat.

ve often stated that the novelties g which are blazoned forth to us n day, were no novelties; that cen- the same facts had been recog- other tillers of the soil.

stance, we have very often in- on the profitability of keeping we find, now that the war on the t has occurred, some of our con- es pointing out the desirability of evoting more attention to hens, t the enormous egg supplies we had ce must necessarily be stopped.

are, as the north country proverb day after the fair." Before quoting *tema Agriculturæ*, we will quote a ority in support of our idea that "nothing new under the sun." hority is Mr Disraeli, ex-Prime of England, and a descendant of to which Solomon belonged. Mr in the preface to a new edition of s, says:—"There is no fallacy so fla- o suppose that the modern ages have ar privilege of scientific discovery, hey are distinguished as the epochs ost illustrious inventions. On the scientific invention has always gone ltaneously with the revelation of truths; and more, the greatest dis- are not those of modern ages. No moment can pretend that printing at a discovery as writing, or algebra as language. What are the most brilliant of our chemical discoveries compared with the invention of fire and the metals? It is a vulgar belief that our astronomical knowledge dates only from the recent century, when it was rescued from the monks who imprisoned Galileo; but Hipparchus, who lived before the Divine Teacher of Galilee, and who among other sublime achievements discovered the precession of the equinoxes, ranks with the Newtons and the Keplers; and Copernicus, the modern father of our celestial science, avows himself, in his famous work, as only the champion of Pythagoras, whose system he enforces and illustrates. Even the most modish schemes of the day on the origin of things, which captivate as much by their novelty as their truth, may find their precursors in ancient sages, and, after a careful analysis of the blended elements of imagination and induction which characterize the new theories, they will be found mainly to rest on the atom of Epicurus and the monad of Thales. Scientific like spiritual truth has ever from the beginning been descending from Heaven to man. He is a being who organically demands direct relations with his Creator, and he would not have been so organized if his requirements could not be satisfied. We may analyze the sun and penetrate the stars, but man is conscious that he is made in God's own image, and in his perplexity he will ever appeal to our Father which art in Heaven." Now, to shew the truth of King Solomon and Mr Disraeli's idea, by a quotation from this book, published in 1669, about

THE ADVANTAGES OF POULTRY.

The Countryman's Farm or Habitation cannot be said to be completely stored or stocked without Fowl, as well as Beasts, yielding a considerable advantage by their Eggs, Brood, Bodies, and Feathers, amongst which the Poultry seems to have the Preheminence, being more universally kept than any other sort whatsoever, insomuch that any poor Cottager that lives by the high-way side may keep of them, being able to shift for themselves the most part of the year, feeding on insects, and on any thing almost that's edible by any other sort of Animal.

They are also kept to a very great Advantage in the backsides, and at the Barns-doors

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mon word in Essex, &c., meaning store pigs tolerable proof, and fit to put up to barley- as.

great Farms, and as I have been certainly informed a good Farm hath been wholly stockt with Poultry, spending the whole crop upon them, and keeping several to attend them, and that it hath redounded to a very considerable Improvement. It seems also consonant to reason, especially if within a days Journey of London, that they might have a quick return, and a good Market, being in a capacity to furnish the Market throughout the year either with Eggs, Chickens, Pullets, Capons, or Cocks and Hens. Also the Feathers must needs yield a considerable advantage, and the dung of Poultry being of great use on the Land, much exceeding the dung of any cattel whatsoever.

Therefore if convenient places or houses were made for them, as dark as may be, which doth much expedite their fatning, and the Poultrey there fed, and their dung reserved, and before it hath taken wet, let it be mixed with Earth, it will undoubtedly answer the expence of a great part of the Corn you feed them withal.

If they are fed with Buck, or French-whea or with Hemp-seed, they will lay more Eggs tha with any other sort of grain.

In Egypt they hatch their Eggs in great quantities in Ovens made for that purpose, in severa places in this Countrey also one Hen will lea the Brood of two or three Hens, so that they b hatched neer about a time; therefore may yo with much facility hatch three or four dozen o Eggs in a Lamp-furnace made of a few boards, onely by the heat of a candle or lamp, so that you order them that they may hatch about the same time that the Hen hatches her Eggs that you intend shall lead them. By which means in a warm room may one Hen lead many Chickens, and raise them up with little charge, and without the loss of time of the other Hens.

This may be of singular use, where you keep Poultry of divers kinds, that is, of the largest kinds to lay, and a few of the lesser to sit, and nurse up the Chickens.

The Garden.

CURIOSITIES OF TRANSPLANTING.

E alterations recently carried on in he old Experimental Garden at Edin- to adapt the ground for arboricultural es, necessitated the removal of a horn- hedge; and a record of the curious of Nature which have attended the nents made with various portions of :dge cannot but prove acceptable to ders.

hedge was planted during the year in order to test the possibility of g a horn-beam fence as described in er's Evelyn," vol. i., page 141, where tated :—"When a German husband- rects a fence of horn-beam, he throws parapet of earth, with a ditch on side, and plants his sets (raised from in such a manner as that every two may be brought to intersect each other, form of a St Andrew's cross. In that here the two plants cross, he scrapes bark, and binds them closely together raw. In consequence of this opera- ie two plants consolidate in a sort of luble knot, and push from thence ıtal slanting shoots, which form a living palisade or *chevaux des frise*, so that such a protection may be called a rural fortification. These hedges being pruned annually, and with discretion, will, in a few years, render the fence impenetrable in every part."

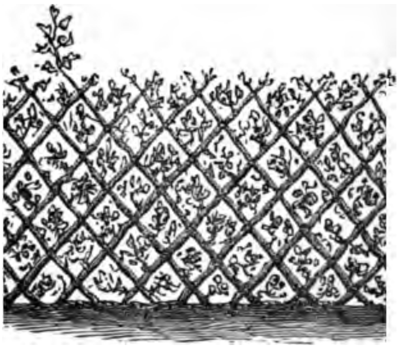


Fig. 1.

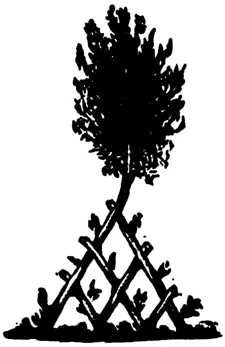


Fig. 2.

The hedge alluded to in the Experimental Garden was originally planted on very sandy sloping ground, and for many years was a great source of attraction to visitors, being so united together that if shaken at one end the vibration was visible throughout its whole length. The sides were annually cut with the hedge shears, which gave it a trim and orderly appearance. The tops were also cut, with the exception of a few standards, left at regular distances, as shewn in fig. 1. During the six years that the Society to whom the garden belonged was involved in pecuniary difficulties, the hedge was allowed to get into a wild condition. It received no pruning the year previous to its being broken up for removal, when the roots were then partially cut on each side, and all the side branches pruned in, the tops alone being left untouched. The hedge has evidently b composed of seedlings, each 7 or 8 feet l , and planted two and two together. One plant of the pair had been made to slope to the right, and the other to the left, plaited at the same time, and afterwards tied at the top with a piece of strong cord, as evinced by some peculiar swellings here and there observed. From the completeness of the union, the bark on each of the adhering sides of the stems must have been removed.

When the recent transplanting of the hedge was commenced, several large portions, varying in length from 4 to 8 feet, were sawn perpendicularly down at each end, so as to sever all the united stems, detaching roots from tops, and tops from roots. The soil was then dug out on each side, leaving large adherent balls of earth attached to the roots. These pieces of hedge were then laid over on a strong board, and carried to their destination, where they were gently slid off into the pits prepared for them. After the pits had been filled in with good soil, the plants were thoroughly watered, and frequent syringing was carried on during dry weather, till such time as the buds began to swell and burst. I then lifted a few flakes, and finding that the roots of some of the outside specimens had to be cut off, I was induced, in order to preserve an end root of each entire, to try some of the fantastic shapes shewn in the woodcuts.

Now that these fantastic portions have come into leaf for the second time, all thoroughly healthy, and with every appearance of continuing so, a few remarks regarding them may be interesting to those curious upon the subject of engrafting. Although the hedge was cut in forty different pieces, only two portions died. In every case of those now growing the union is most complete, as seen by the swellings at the various points of junction, and the larger and more complete the union, the greater was the liberty taken with that individual specimen. All the specimens were transplanted during the months of February, March, and April 1869.

The perpendicular-sided or square specimens (fig. 1) which were first lifted, still shew the original character of the hedge. To lift them all in this manner, it was found that a considerable waste of plants would be incurred. The preventing of this waste, as before stated, suggested the forms which many of them now present.

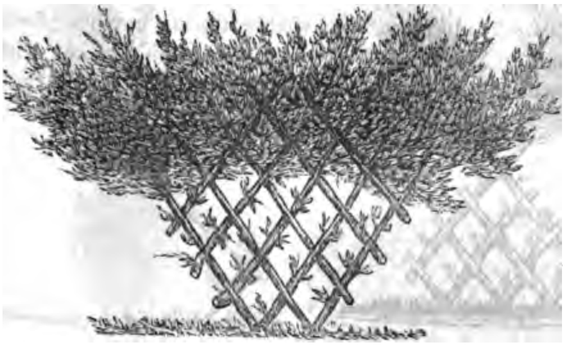


Fig. 3.

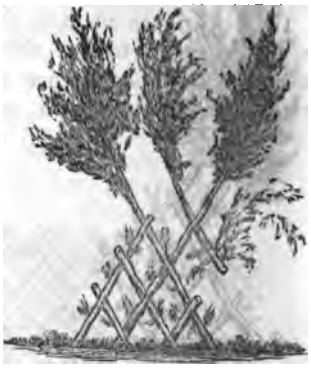


Fig. 4.

In fig. 2 the roots of six plants are united. The growing top is on its own root, although supplied indirectly by the roots of five other plants.

Fig. 3 forms a sort of living letter **W**. This example had the roots of three of the stems severed or cut off on each side; these now belong to one of the sides of fig. 4. Owing to the mass of adherent earth removed with this specimen, I felt convinced that the four lower or rooted portions might succeed, but could not be certain of the others; notwithstanding this uncertainty all are now in full leaf. The cut extremities, of this as well as of all the other specimens, after being severed with a saw, were smothed over with a sharp nife, and afterwards covered with soft clay, hich still remains on many of them.

Fig. 4 was also lifted with a chance of uccess, so far as the two principal limbs were oncerned. On this specimen a third head ras left, with a part of its stem projecting 15 nches below the point of union; and, alhough clayed over like the rest, it was not xpected that it would live. To my surprise his rootless portion put out last year new growths from the joints of some old side hoots, and these have been greatly augmented this year, the longest being now upwards of 2 feet. It is certainly one of the most remarkable of the whole.

Many of the other specimens shew similar rowing points from the cut projections, but s they generally range from 3 to 5 inches, he result is less extraordinary.

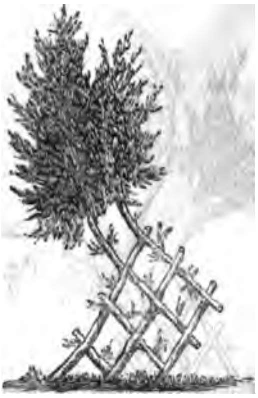


Fig. 5.

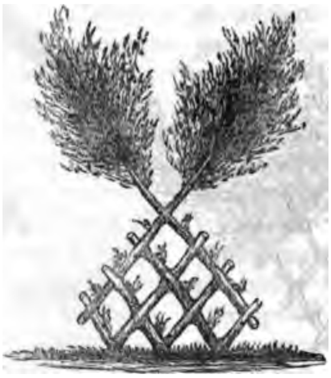


Fig. 6.

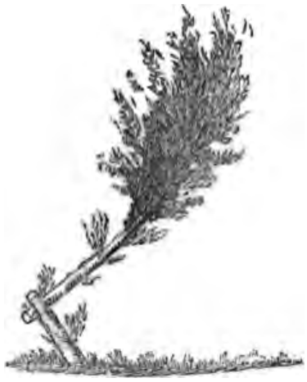


Fig. 7.

Figs. 5, 6, and 7, were the next speciens prepared. In fig. 5 two tops were left, ach having strong stems, the root portions eing cut off, receiving nourishment, more or ess, from five roots. The tops of the three ore direct feeders were taken off so as to hrow the whole vigour of the roots into the wo adopted leaders. The tops are equally ealthy, and each has three attachments, two n one side and one on the other; and, lthough the lowest attachment is only on ne side, the stem is equally healthy all ound.

Fig. 6 has two growing tops left, and although solely supported by six rooted stems they are likewise doing well. In this example, each of the growing portions has three attachments, two on one side and one on the other, besides being joined to each other at the top.

With fig. 7 this experiment was carried still further, the top and stock being equally strong. Although the union is only on one side, it is sufficiently nourished by a single root. This was a trying experiment, as the cut extremities were 8 or 9 inches in circumference, but, notwithstanding that the side portions were detached, the plant is perfectly healthy.

As the season advanced, and the results of the first experiments were satisfactory, as evidenced by the partial swelling of the leaf-buds, I was induced to try two other experiments of a more hazardous nature, and they also have been attended with success.

Fig. 8 has the main portion of the stem, which was originally in a sloping position, planted upright, having two cross portions left, each deprived of top and root. One of these portions is attached on each side. These cross portions continue to grow, and are supplied with sap, right and left, from the central stem, although only partially embedded on one side.

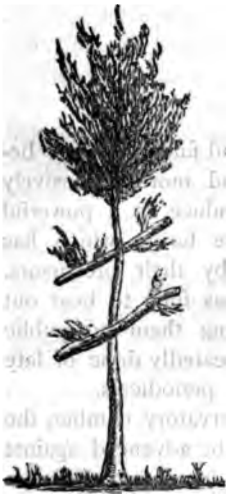


Fig. 8.

The last, and perhaps the most comical of the whole, were two specimens lifted and placed in such a position as to have the tops and roots exposed. One has four supports, and the other two, as in fig. 9. In this example, one portion of the root, about three-quarters of an inch in diameter on the under side, was inserted in the soil, all the others being left exposed. The stem, between the root and the first upright, is covered with young growths, and the top is as healthy as any of the others. The tops of the leading supports were cut off so as to throw all the vigour into the horizontal stem. It is curious to observe in some instances the effects of a weakly stem when united to a strong one, as seen in fig. 10; the portion ot the weakly stem below the junction frequently remains much in the same condition, while the part above the junction often flattens out to 4 or 5 inches in breadth, and not over 1½ inch in thickness. It sometimes happens that one of the stronger stems, instead of enlarging up its own natural stem, takes an opposite direction, and leaves its own top weak. In fig. 9 it will be observed that the point A is the original top of root portion B, while the top C is the original top of the root portion D, having quite an opposite tendency from B A, while comparatively little difference is seen in F and E,—E being the top end. In this example the strength of B has run up through a portion of the stem of F E, and gone into the top of D C, thickening it up at the point G.

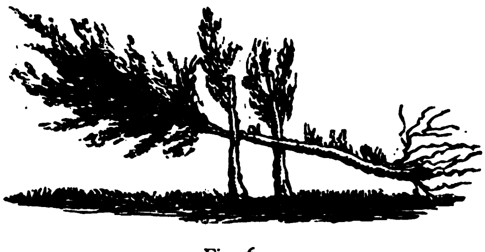


Fig. 6.

It is to be regretted that such hedges are not more generally used in this country, as they make such impenetrable fences. For villa gardens or railway embankments nothing could answer better, as they can be planted at once of full size, and could be made impenetrable to sheep immediately after planting.

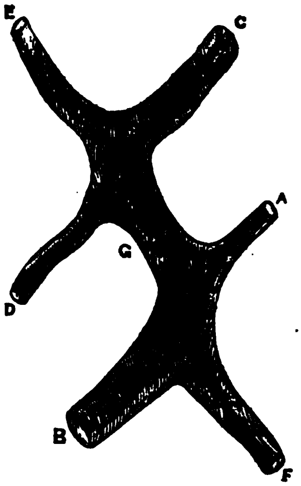


Fig. 10.—Vertical Section of Stem.

Although the horn-beam is the plant hitherto suggested and employed for this particular kind of hedge, many other species of plants could be profitably used, such as elms, hazel, ash, beech, laburnum, and willows: and now that the produce of the silkworm is again becoming an article of commerce in England, hedges so constructed of mulberry plants would be found useful as a fence, beside yielding a very large amount of foliage for feeding purposes.—*James M'Nab, Curator of the Botanic Garden, Edinburgh.*

GREENHOUSE CLIMBERS.

PASSION FLOWERS—THE CLEMATIS.

THE family of Passifloraceæ has at all times attracted a large share of attention among the lovers of interesting plants, and comprises, in its various branches, many varieties peculiarly suitable for conservatory decoration, adding, in many cases, deliciously flavoured fruit to flowers beautiful in colour and handsome in form; thus giving an additional incentive and reward for the labour expended in their cultivation. Among the large number of varieties now in cultivation, a considerable section is found to require the strong humid heat of the plant-stove; but a sufficient proportion has been found to succeed in a cooler temperature, to leave the would-be cultivator plenty to select from. The treatment required by all of them is so similar to that recommended for the Tacsonia, that it is almost unnecessary to repeat it here in detail. Premising that they are liberally treated in respect to food, solid and liquid, and every precaution taken to subdue insect enemies and insure cleanliness of foliage, a rampant growth may be anticipated. But even when this is attained, the work of the cultivator is but partly completed, and all his exertions to secure a crop of blossom for the following season will prove futile, unless he succeed in thoroughly ripening the wood as the plant sinks into its quiescent state. If, however, a thoroughly matured growth can be secured, plenty of bloom may be ensured, providing the shoots be well cut back in spring, and abundance of liquid manure applied during the growing season.

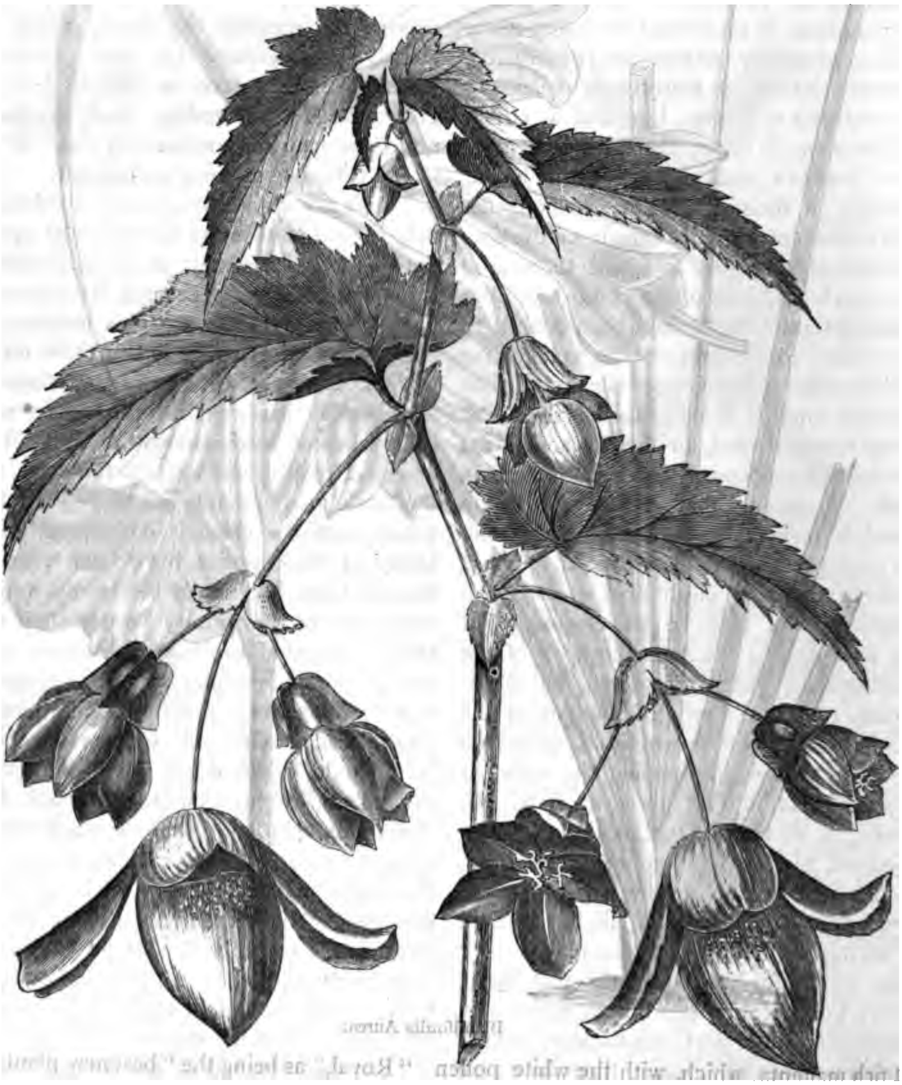
The wonderful improvements that have, within a very recent period, been effected by the hybridization of the Clematis, have had the marvellous effect of bringing them, in a very brief space of time, from a position of comparative obscurity to the very front ranks of fashion in the floricultural world. And, doubtless, when the newer and finer varieties become better known and more extensively cultivated, they will conduce, in a powerful degree, to intensify the furore which has already been created by their precursors. Their merits are such as fully to bear out every one recommending them to public notice, as has been repeatedly done of late in the various gardening periodicals.

To its use as a conservatory climber, the only objection that can be advanced against the Clematis, is its habit, in common with the majority of plants, of turning its expanding flowers toward the sun. This involves the necessity of selecting for it a position on the walls or glass sides of the house, where the flowers may be brought within gaze; as in cases when it is trained to the roof, all the flowers being turned towards the light, only the backs of the petals are to be seen from below, and the effect is consequently lost. Many of the varieties have been found to flourish most luxuriantly in the open air, in most parts of the country, so that they need only be adopted as in-door climbers, in the case of the more tender varieties, or in situations too bleak for them to succeed out of doors. Such varieties, however, as magnifica, John Gould Veitch, Lady Bovill, lanuginosa, Jackmanni, rubro-violacea, Fortuneii, Standishii, &c., will always prove worthy of the space devoted to them, providing they receive the slight amount of care their necessities demand. Their requirements are of the most simple nature, and may be summed up in the usual generalities: Let them be planted in rich loam and leaf mould, well drained, and let them be liberally supplied with moisture, both at the root and on the foliage, and get the wood well ripened and cut back in the spring, and the result need not be feared.—*J. Lorimer, Bradford Nurseries.*

NEW AND RARE PLANTS.

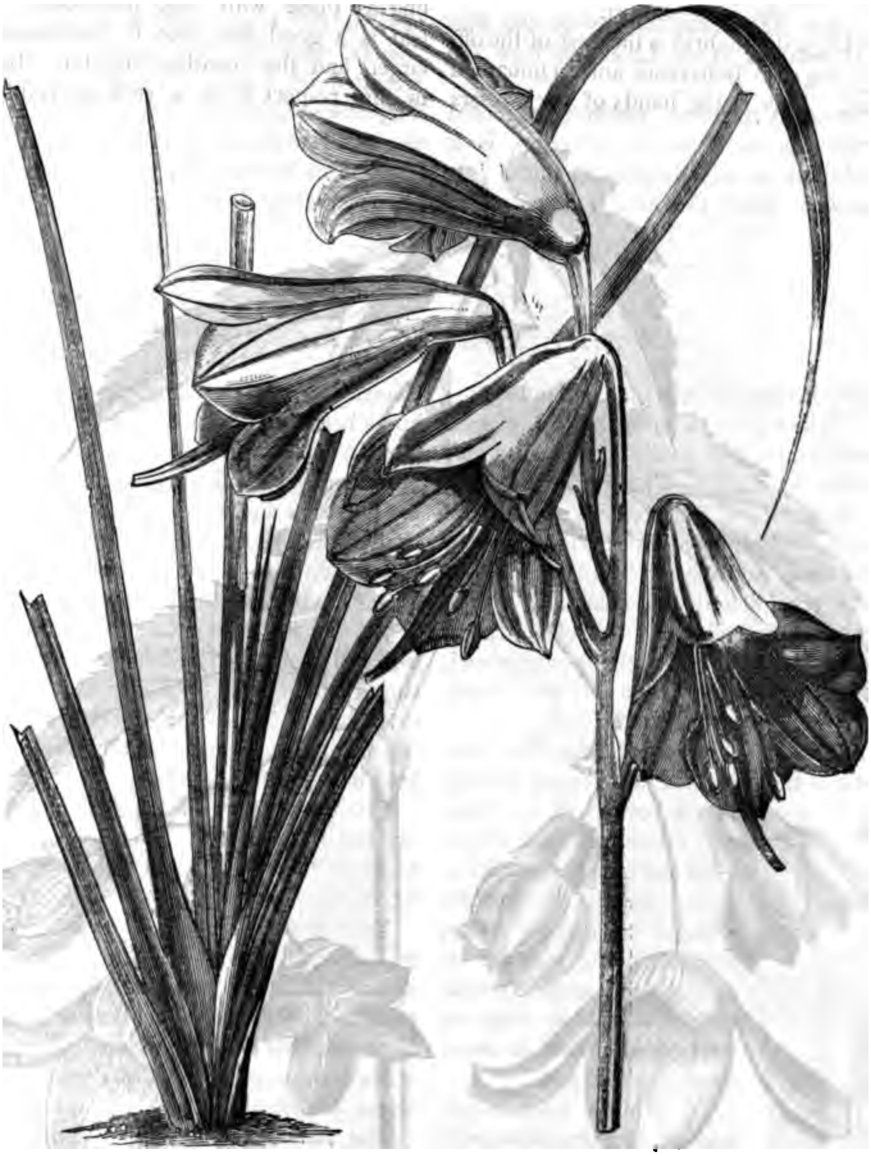
BEGONIA SEDENI.

THIS garden hybrid is the best of the offspring of B. Bolivensis, and an unnamed seedling. It is in the hands of the Messrs Veitch, to whom we are indebted for the engraving. In habit, it is free, and not so rambling as those with long internodes. The leaf is a good deal like B. Bolivensis, but larger, and the venation brighter. Indeed, in this respect it is a striking plant, and quite characteristic to the not very intent observer. The stem is erect and stiff, bear-



Begonia Sedeni.

; deeply laciniated leaves, from the base of ich the short flower raceme proceeds in a ooping form. Flowers come in singles, ubles, and triples, according to the strength the plant. The colour of the flower is of rich magenta, which, with the white pollen asses in the centre, give a sort of setting to e gorgeous petals, which is extremely eye-easing. It has also the meritorious trait character, which we long to see impersonated in flowers—persistency and duration of bloom. That it is one of the handsomest of the Begonia race, and the best of its year, is attested by the "silver medal" which was awarded it at the New Plant Show of the "Royal," as being the "best new plant shewn for the first time in bloom, in June 1869."



Blandfordia Aurea.

BLANDFORDIA AUREA.

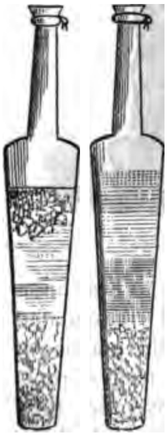
This tribe of handsome flowering pl[illegible]ts is not so much known as it ought to be. Coming, from New Holland and New South Wales, a cool temperature is all that is required to bring out their floral attractions. They grow somewhat slowly, but once had in flowering condition, and they are as regular in their display of flowering scapes as any of the Hemerocallideæ, or Day Lilies as they are called.

The one in question, which is engraved from the Messrs Veitch's collection, is a good addition to already existing sorts. It is somewhat after the form and colour of B. Cunninghamii, but not quite so strong in habit. In this respect, it is more like B. nobilis and B. flammea. The scape rises to about two-thirds length of leaves, and at the extremity are the golden flowers, slightly coloured with orange-scarlet towards the base. The bell form of the flowers, and the graceful way they are arranged on the scape, together with the long arched ligulate channelled leaves, invest the plant with an elegance that admirably fits it as an associate for the most aristocratic of conservatory flowering plants.

A SIMPLE WEATHER-GLASS.

THIS instrument is prepared as follows:—Take a glass 10 in. in length, and 1 in. in diameter, and fill it nearly up to the top with the following liquid:—Two parts camphor, one part nitrate of potash, and one part sal ammonia, and dissolve in strong spirits of wine; then add water until you have partially precipitated the camphor. The extremity of the tube can be left open or hermetically closed. The tube thus prepared, is fixed horizontally against a wall or a board, and the changes are thus indicated:—

1st. If the weather is to be fine, the composition of the substance will remain entirely at the bottom of the tube, and the above liquid will be clear and transparent. See B.



B

2d. Before the weather changes to become rainy, the precipitate will rise by degrees, and small crystallizations, similar in shape to stars, will be seen to move about in the liquid.

3d. When a storm is imminent, the precipitate will nearly all rise to the top of the tube, assuming the shape of a leaf, or an assemblage of crystals; the liquid will appear to be in a state of effervescence. This change very often takes place twenty-four hours before the change in the weather.

4th. The side from which the wind will blow in a squall will be also indicated through the direction and the elevation of the crystallization in the tube, the crystallization always forming on the side from which the wind will blow.

5th. In the winter season, the crystallization will maintain itself higher in the tube; snowy and freezing weather are also indicated by the particles of the substance floating in the liquid, and assuming the shape of long hairy needles.

6th. In summer time, the weather being dry and warm, the crystallization will have a tendency to remain lower in the tube, and the liquid will also be more transparent.

The amount of crystallized particles which will be seen floating in the liquid is a sure indication of fine or bad weather, but will depend entirely on the suddenness of the change in the weather which is to take place, acting in the most energetic way on the composition above described.

The value of this simple instrument, to forewarn of an impending storm, and also to indicate the continuance of fine weather, will be readily appreciated by those whose occupations are affected by changes in the weather.—*Journal of Applied Chemistry.*

BULB JARDINETS.

We reproduce here, through the courtesy of Messrs Barr & Sugden, two very well-filled jardinets. Our sitting-room plant growers will exclaim, "What spikes for size! Impossible to get such, we should be thankful to have our half dozen with as many flowers as appears here on a single spike! And then, again, look to the dwarfishness of the foliage scarcely going beyond the flower base. Wouldn't that be beautiful, and indeed charming, if we could by approach imitate the perfection pourtrayed here." To this we have to say that there is certainly an appearance of flowers in multitudes and in arrangement far beyond the capacity of most sorts in commerce, at least, beyond what is to be gained *en masse*. Our great growers, Messrs Cutbush & Paul, have shewn single spikes nearly equal to what are pourtrayed, but then the very essence of the most advanced practice was brought to bear upon them. Their dense habit and consolidated foliage are due to following out the practice of keeping the bulbs cool until the mass of roots were in considerable progress, and then giving them abundance of light and air to finish up their growth and inflorescence. Carrying out a routine of operations intelli-

Prince of Wales' Jardinet.

Ne-plus-ultra Jardinet.

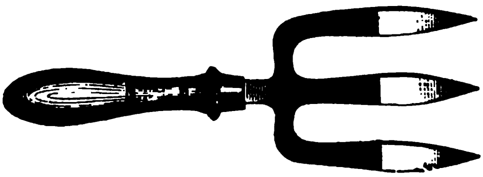
gently, the grower may have much of the aggregate beauty that is to be seen or imagined in these engravings.

The Ne-plus-ultra Drawing-Room Jardinet is of simple cylindrical form, made, as usual with all such fancy designs, of terra cotta. The bulbs can be planted in it any time during this or the preceding month, stored away like potatoes for a time, and brought to light to develop their hidden beauties. A little green moss on the top of the soil adds much to the order of the group, and renders the whole in keeping with the place which may be intended for their ultimate reception.

The Prince of Wales Drawing-Room Jardinet is a more elaborate design of the same material. It is terraced or tiered to add to beauty of character, grace of outline; and where ladies or gentlemen can be successful with the carrying out of the ultimate object, there are few sights could be more winning. Interspersed as the hyacinths might be with crocuses and snowdrops planted a little later, this Jardinet might be like a living floral bouquet, without either its artificial or evanescent character. Then the pockets, or niches, or recesses, could be devoted to a stray fern, always so welcome in the company of flowers. These, to be grown well, should be put in glass houses until the fronds begin to expand, when they may be transferred to the drawing-room, and yield their full crop of beauty.

TRANSPLANTING FORK.

To be provided with handy tools, in the carrying out of any operation, contributes greatly to expedition and success. To dig round a bush of any size with a garden trowel, would be a child-like operation, and only permissible when children, or the elfs of the "Arabian Nights" entertaining stories, were engaged in the work. For transplanting large plants in the herbaceous, or flower border, sometimes a more ponderous, or rather, a more efficient tool is desirable. A spade is a useful implement for almost anything, but it sometimes is too large to get in about plants growing closely together; and, what is a worse fault, it is not so portable as the handy transplanting fork here engraved.



The Transplanting Fork.

A trowel lifts the plant and the soil which it envelopes as well. The transplanting fork loosens the soil, and, by this means, disengages the roots from their growing quarters; and, with the assistance of the direct lift of the hand, the roots of the plant only keep so much about them as their fibres will conveniently hold by. By this means, you may transfer several plants to a basket, and carry them to a more eligible or desired spot—there plant them; and if the operation is carried on from first to last with care, they are not very much incommoded by being thus removed from one home, and transferred to seek protection and strength from the food presented at another place. Water is the great immediate restorative. It comes in to do the kindly office of stimulating, safely, alike the fainting plant and animal. In the case of the plant, it stops the bleeding roots and the stomates of the leaves are largely charged, ready for the machinery of the plant system to drink it in. Every gardener should think that, when lifting plants that have been growing for some time in good quarters, how destructive it is to move; because, under the best and most careful system of planting, you can neither replace the young roots in the same position, from the base outwards, nor, under any circumstances, can you fix them in the earth so firmly and so comfortably as they can do themselves, if time and proper elements of success are allowed.

Work in the Garden during December.

From "THE VILLA GARDENER."

ıBER sounds the knell of the year, but
of our year in THE VILLA GARDENER.
t our ninth month. It is rather fortunate,
hat the year and our first volume do not
her. Amid the wintry air of December,
ty of THE VILLA GARDENER carries us
the gladdening gleams, playful showers,
ous, tender life of laughing April. The
April ever reminds us of a merry, coy,
iden, brimful of mischief. How it teases
warm sun glances of light and love, and
o melting moods under its genial dews or
ers, only to pelt us the next moment with
hail, or chill us into iciness with a snow
But the bare trees are stripped at last!
ly the leaves of oaks, elms, and even
; the trees, as if afraid to leave their
out in the cold. This reminds us that
work must be done. The glorious autumn
. gone.

ath-flushed trees that in the falling year,
Assyrian monarchs clothe themselves
ir most gorgeous pageantry, to die,
l bald-headed now."

t beauty there is in their baldness! The
ı of the branches are marvels of grace and
rm. We have learned to admire beeches,
ther trees, almost as much in winter as in
And then the glow from an avenue of
d lime trees throws a glimmer of light over
st winter day.
des the beauty of this general disrobing in
have only to note its usefulness to be
th Nature at all times and in all seasons.
ves not fall, the trees would all be wrecked
e burden of winter snows. A few years
l a heavy fall of snow early in November,
leaves fell. It collected and rested upon
It was piled up higher and higher,
. thicker; it grew heavier and yet heavier,
a succession of sounds like the discharge
was the cry of distress coming from whole
ees, wrecked and riven by the weight of
ms. Coming nearer to our work within the
fall of the leaves reveals and suggests
ır work for the month. We can now see
ır trees are properly and skilfully trained,
e or a shred pinches, or a nail wounds,
where the insects have made a home, or a dead twig or branch has escaped notice; how nooks and crannies want sweeping clean, or filling up where old wood may be cut out and young laid in; and how, in a word, all trees and branches, of whatever kind, can be moulded into form, made fast to their supports, and rendered scrupulously clean.

Rebounding again from these very practical views into the regions of sentiment, the bare trees, rightly interpreted, do not speak to us of death, but of life. According to Professor Owen, the leaf does not fall because an old leaf dies, but because a new leaf is born. The advancing head of the new leaf within its scaly case—the bud, first loosens, and then pushes off the old leaves. These bare trees, thus read, are emblems of an imprisoned life, waiting for the sun to summon them forth from their cold-proof homes—not symbols of shivering ghosts stripped by death of their glorious beauty. May such thoughts lighten the work of the month, and cheer those of our readers whose zeal in gardening may be apt to sink to zero with the thermometer!

KITCHEN GARDEN.

Ground work should be the great business of the month. Is the garden wet? Drain it. Is it poor? Enrich it with fresh soil or manure, and deepen it to a depth of a yard, if possible: so much is indispensable to the production of the best vegetables. Such operations are heavy work, and afford healthy exercise in harmony with the season. It is astonishing the amount of pleasure that may be derived from digging, trenching, draining, or wheeling in cold weather. The bodily exercise is the best possible stimulus and the most perfect cure for *ennui*. We often pity ladies, because it is not fashionable for them to dig. There is no constitutional equal to it. Walking or running may exercise a few muscles or parts of the body, —digging, the whole. We pity, also, the horticulturist who cannot dig in winter; for what else can he find to do to keep him warm in the garden? Plain instructions have already been given for learning the art; and if at first, in the language of the nursery rhyme, any of your readers don't succeed, I can only exhort them to "try, try, try again." From digging it is easy to rise, or rather sink to trenching. Draining is work not adapted for amateurs—dirty, wet, exact work, about which full instructions will be given in other portions of THE VILLA GARDENER. Depth, fall, and distance apart, are the main things. Depth should be

4 feet; fall, 1 in 15 or 20 feet in gardens; and distances from 12 to 30 feet. Form, material, size, &c., &c., are all of secondary importance. Wheeling earth or manure, again, on a frosty morning—what good sport and manly exercise it is, and how it sweetens breakfast, and prepares for a day's work at desk or in study! No amateur will garden successfully who fears or shuns such works as these. They excite interest, bring knowledge, and sustain enthusiasm, just when it is in most danger of being snuffed out with the cutting plants that are backed up with the driving sleet or blinding snow-drifts.

This suggests a caution or two. Never dig, nor wheel, nor trench ground when it is wet enough to puddle under your feet. Don't dig or trench when snow lies on the ground. Should, however, it lie long, it may be shovelled and swept clean off, and digging or trenching go on as before.

With these exceptions, if the frost permit, the digging or trenching of all vacant ground may be proceeded with during the month. It is not wise, as a rule, to dig or trench ground when hard frozen. It keeps the earth for a long time at a low temperature. During slight frost, ground already dug will cake over the surface. It is good practice to turn such cakes with spade or fork, so that the under side may be done fine as well as the upper. There is no pulverizer equal to the frosty air. And then, when the frost king comes forth in his strength and binds your garden in fetters of iron, that is the very best time to do all your wheeling. We have never frosts strong enough to bind our manure or compost heaps so hard as to render them immovable. And how light the barrow runs with its load over the smooth frozen surface of walk or ground! It is a perfect pleasure to drive it along, and topple it over and over again for a fresh load. You may run a dozen barrow-loads before breakfast without soiling your boots. All the manure for your spring and summer cropping may thus be placed on the very spot where it is needed, months before you require it, to the forwarding of your summer work, the saving of your walks, and the delightful exercise of yourselves on frosty mornings. This is also a good season for making or repairing walks or roads. Full instructions have already appeared in THE VILLA GARDENER, and we have nothing to add to them.

Cropping.—There is little or none of this at this season. A first sowing of early peas may be made, if not sown last month; or a second, if these have suffered by accidents from vermin. Mice and rats are often wonderfully destructive at this season. The fields are bare, and such ravenous visitors troop into our gardens, and make a clean sweep of such tender morsels as they can find. Black slugs are also very active under ground, and manage to destroy our crops at times in spite of all our precautions. A little earth should be drawn up to peas and beans in dry weather, to nourish, shelter, and strengthen the stems.

Celery.—Earth up in dry weather, and protect from frost. Take up a week's supply at a time.

Walcheren Brocoli.—Cut every head fit for use twice a-week, to prevent its being injured by the frost. During mild seasons, a good many of these will come in for use during this month. It is a good plan to pull them right up, root and all, and hang them up by the heels in a frost-proof pit, shed, garret, or cellar. They will keep sweet, crisp, and good thus inverted for a month or six weeks. Placed closely together with their roots in the ground under protectors, pits, or frames, they will keep good all winter, and afford the rare luxury of cauliflowers all the year round.

Lettuces may be preserved in the same manner. Growing crops must now be pushed on under the protector, cloche or hand-lights. The French seldom give any air to lettuce under cloches, and it certainly is not essential. The high temperature caused by the sunshine stimulates the plants, warms the ground, and proves an antidote to the cold at night. During very severe frosts, however, all such temporary shelters will need a secondary protection of straw litter to exclude frosts.

Cauliflower Plants for next spring require the same attention as to covering, and they must also be carefully attended to in the matter of giving air. Such extremes of temperature as may sweeten or force lettuce, would cause a cauliflower plant to button or run up prematurely into flower—the greatest evil that can befall such plants—and, must therefore be avoided by the maintenance of a regular temperature.

Radishes.—A few of the earliest varieties may be sown at the foot of a south wall, or on a south sloping bank, to be sheltered with a thin layer of straw during severe weather.

Carrots.—A pinch of Early Horn carrot may be sown in similar places, and receive the same treatment.

Endive may be taken up and placed in the cellar to preserve and blench. Plant the roots in sand or earth, and keep the tops cool and dry, and in the dark.

Continue to place a few more roots of *rhubarb*, *seakale*, or *asparagus* in warm places, to excite growth, as pointed out last month.

Hoe the ground among *winter crops*, such as onions, spinach, and cabbages. Remove all dying or dead leaves, and see that no frost-killed vegetables are allowed to pollute the air with their abominable odour. Nothing can be more offensive nor more unwholesome. In using such vegetables as Savoys, Brussel sprouts, or Scotch kale, in severe weather, they should be cut in an unfrozen state the previous day, or very early the morning of the day they are to be used, and thrown into the coldest water until all the ice is drawn out of them. If it be attempted to cook them in a frozen state the flavour is utterly ruined. If, as is sometimes done, they are taken straight from the garden, and thrown into hot boiling water, the heat induces a state analogous to rottenness. Carefully examine

ınd *onions*. Remove any deciyed or bruised.
frost, and keep a regular temperature of 40
as near as may be. Onions will bear frost
punity when in a dry state. Still it is wiser
low the frost to reach them. It can hardly
ıl to add, that frost is ruinous to potatoes of
and sizes.

) and roll the main walks, and let no weeds
be seen ; and thus will the kitchen garden be-
ource of interest and pleasure throughout the
son.

THE FRUIT GARDEN.

uit trees and bushes ought to have been planted
nth. For the reason why, see November.
t were impossible to get through the work then,
till be done. The best time has gone by, but
er is better than January, and January than
y, and so on up to April, when all planting of
ıs trees must perforce cease. The great cause
in spring planting is the simultaneous starting
p and root. The root is more or less disabled
led. It is unable to send forth the same sup-
before. The top waits not upon this. It
off as if nothing had happeneed. The conse-
is, the tree is suddenly drained dry, utterly
d of organizable matter before the roots are
et fairly at work. The result is either death
er exhaustion, or a degree of debility, ending
l paralysis, or lingering disease. Almost the
ınce of success in spring planting consists in
the top in the exact ratio to the impaired
of the roots, and to check the expenditure
herent force stored up within the tree by the
ance of a moist atmosphere. We all know
icult, if not impossible, it is to do this out of
March, and hence the impolicy of late winter
ng planting. What with the cold earth and
harsh air, the tree often perisheth before the
y equilibrium can be re-established between
cting power of the roots, and expending force of

Presuming that the planting is finished, the
the month in the fruit garden may be summed
r the heads of mulching, pruning, training,
, smearing, staking, and manuring.

Mulching of newly planted or freshly root-
rees, we deem to be essential to the complete
of these operations. It keeps the cold out and
and the moisture in, and nourishes the new
ots. Nothing benefits trees that may have
erstrained by excessive cropping, so much as a
from 2 to 4, and even 6 inches thick, of rich
decomposed manure. Applied to the surface,
ces none of the evil effects of dung mixed with
h in which the trees are planted. Surface
gs strengthens without causing grossness. In-
the practice being accidental, it ought to be
It is one of our best helps in successful
either in summer or winter. In summer, it
he roots from the fierce glare of the sun, and
enables them to pursue their way without interruption from drought or feverish excitement from excessive heat.

Pruning.—Now the boughs are bare, all pruning ought to be pushed forward in suitable weather. It is not good practice to prune during severe frost. The wood is apt to split and rive if cut in a frozen condition. But at all other seasons, prune hardy fruit trees and bushes. Begin with cherries, and proceed to plums, apples, and pears. By the time all these are finished the season will have arrived to proceed with apricots, peaches, and nectarines. Small fruits, such as gooseberries, currants, and raspberries, may also be pruned at once. Every reader must know how to prune gooseberries and currants. Leave the main or leading shoots from 6 inches to 1 foot long, and cut all the side shoots to within two buds of their base. Black currants must be treated differently. They should not be spurred or stopped ; only a few of the oldest weakest shoots cut out when the bushes become too large or overcrowded with wood. The pruning of raspberries consists in cutting out the whole of last year's wood, and thinning out the young shoots to from three to six of the strongest to a shoot or root. If the canes are very long, cut the heads off, and leave them about a yard in height. The mode of pruning other trees was given last month.

Training is a cold business in December. Still, by picking mild days, or glimpses of sunshine, and by feeding the fire of enthusiasm within, it is astonishing how nimble and expert and warm the fingers become even in training trees on the bleak face of a bare wall. There is a great charm in good training, and it reaches its highest examples in those fine Morello cherry trees occasionally met with in large gardens in the north. We have a lively recollection of spending a whole week one cold winter behind a north wall in the gardens at Scone Palace, training a Morello cherry tree. One of the proudest moments of the writer's young life was when it *passed* the master's eye unchallenged. Every primary and secondary leader, and young shoot were straight as an arrow, and the whole were regularly disposed over, we forget how many square feet. There was not only beauty but grandeur in some of those fine trees. Possibly none of our readers will ever have to undertake such a big job of training. But all can bring enthusiasm to the business. This will not only make them forget the cold, or keep them warm, which is practically the same thing, but will also make them train tastefully and with despatch.

The *Cleaning* of trees should precede training, though we have placed it after it here. Trees ought to be unfastened from the wall and untied, to be thoroughly cleaned. The process of cleaning begins with the removal of all extraneous matter, such as dead leaves, rotten fruit, decaying bark, soot, dust, or other matters. These attract and conceal insect pests, and their removal is chiefly a precautionary or preventive measure. Then there direct attacks upon scale, American blight, and larvæ of various kinds. All these must be washed, scrubbed, or scraped off, and bodily removed.

Smearing or Painting are time-saving expedients, to prevent the necessity of so much scrubbing and cleaning. Instead of removing insects in detail, smearing suffocates them in the mass. This is the primary object of all smearing. It matters less what they are made of, provided the plastic mixture is adhesive, penetrating, and thick enough to smother insect life. Thinner smearing will suffice to save sweet buds of gooseberries and fruit trees, from the ravages of birds, they do not appreciate a sauce compounded of cow-dung, soot, lime, tobacco water, or any nauseous constituents. Such smearings are also useful for removing moss and destroying fungus on the trees.

The *Staking* of fruit trees and bushes is also seasonable work for the winter. Young pyramids and other trees or bushes need a stout stake to render them immovable, and to preserve their form. Gooseberries and currants look noble, trained thus to a single stake, to a height of from 3 to 6 feet. It is a pleasing diversion from the flat bush or open vase style, and the fruits easier gathered and pocketed.

The *Naming* of fruit trees is another important winter work, often sadly neglected. It is a great pleasure to have all fruit trees correctly and legibly named. The more neat and durable the labels, and the plainer the writing, the better. A narrow strip of zinc rolled loosely round a branch, with the name written with indelible ink, forms a good durable label. Others more ornamental may be found in the advertising sheet of THE VILLA GARDENER.

Where the gooseberry caterpillar has proved troublesome, this is a good season to adopt radical measures to get rid of it. Some of the most effective is the total removal of the surface soil, down to the roots. This gets rid of all the larvæ, and as the caterpillars have not yet learned the art of spontaneous generation, the pests vanish the following season. Another method is to cover the ground under the bushes with 4 inches of fresh tan. This either kills the larvæ or prevents them getting through. At all events, they are no more seen.

Strawberries may yet be top-dressed. It is a good plan to put on fresh horse dung now, straw and all, just as it comes from the stables. Its strength is washed out for the benefit of the plants, and before next year's crop is ripe, the strawy litter will be bleached white as snow, and form a clean bed for the luscious fruit. A layer of fresh tan applied now is also wintered into a clean bed by next June, and the plants do not seem to be injured by the tan.

Fruit Stores.—Examine twice a-week for specked fruit, remove promptly, maintain an even temperature, keep out frost and light from the fruit, and avoid all sudden changes. Make notes of the dates when the different fruits ripen. By such means much useful knowledge, for other times and seasons, will be acquired. Not only do fruits ripen at different times in different localities, but they vary almost every year. A correct register of the times of ripening, through a series of years, would not only be interesting but most valuable.

THE FLOWER GARDEN.

Alas! with the departure of the late Tritomas and Michaelmas daisies, the flower garden hardly deserves its name. It is well nigh flowerless in December, though not quite, for there are some Christmas roses pushing up their great saucer-like flowers, as if wanting to be filled with snow; and here and there, in warm nooks, perpetual heartsease is still blooming, though their hearts are frozen into icy coldness every night, and Alyssum saxatile buds are tipped with gold, and Arabis alpina opening its blanched blossoms to the sun, and single anemones hastening up, as if afraid the open weather would not last till they spread abroad their gay, flaunting beauty; and last and best, the Myosotis dissitiflora, loveliest of all the forget-me-nots, shews in tiny patches, its azure borrowed from the blue sky. Sometimes, too, during the month, hardy annuals, such as sweet Alyssum, Clarkias, stocks, Nemophilas, go on flowering, adding a summer-like brightness to this dead season. Verbenas, too, sometimes bloom throughout the greater part of the winter. Calceolarias also frequently throw up little golden crowns here and there. All such fragments tend to cheer the mixed border and garden throughout December. Then, among shrubs, the Daphne mezereum often rounds off its blossoms into an explosion of sweet scents, while the Chimonanthus præcox opens its treasury of perfumery from the face of sheltered walls. The Jasminum nudiflorum covers such positions with fleecy flowers of the deepest yellow; while different Ericas dye the earth deep with their crimson hues, and the grand old laurestinus clothes itself in sheets of purest white or blushing purple blossoms.

With these and other signs of life, and green grass smoothly rolled, and clean walks, hard, dry, and even, and beds filled with winter or spring flowers just waking up into life, or bulbs of various kinds making the ground alive with their nursing roots, we now enjoy the pleasures of hope, thinly sandwiched with present beauty.

In some gardens, however, there is quite a glow of beauty from the middle of November and all through December, proceeding from that grand, hardy family of plants—the chrysanthemum. They grow in sheltered beds, or against walls; and, slightly protected from severe frosts, make a grand display, and rival in brightness and purity of colouring in many of our summer flowers. As the strain upon them is great during the flowering season, they should be assisted with manure-water. Especially is this necessary to plants growing against walls or under glass.

Hollyhocks.—Rooted cuttings or seedlings may still be planted out in open, mild weather. Mulch these and all choice varieties with short dung round the roots, and finish planting all bulbs, if not already done, such as tulips, hyacinths, narcissuses, ranunculuses, anemones. All bulbs should be in the ground by the middle or end of this month. Choose dry weather, if possible, for planting Crocuses and snowdrops, and golden Aconites should now be coming through, and the Helianthus or Christmas roses will be in full blossom by the 20th.

All the common sorts of gladioluses may likewise be planted, though most of them flower as well, or better, if kept till February or March. None of the new or choice varieties should be risked in the ground out of doors in winter.

Beds or borders of choice bulbs should be protected from severe frosts. Mats are often thrown over hooped sticks for this purpose. A simple mode is to place 6 inches of rough coco-nut fibre refuse over the surface of the ground. This is frost proof, and it can be readily removed when the dangers from severe weather are past.

The roots of Marvel of Peru, dahlias, of salvais, and gladioluses must be kept free from frost, and carefully examined to guard against rottenness, damp, &c.

Shrubberies.—Clean, dig, and prune. When shrubberries are properly furnished, little digging will be possible. Raw edges of dug ground are intolerable boundary lines to choice shrubs, scars of ugliness of the worst type; and no lines of beauty are these thin strips of arable land, which used to be the order of the day between the verdure of the turf and the foliage of the shrubs. They are gradually disappearing, and in perfectly furnished shrubberies the velvet cushion of turf is swept back as a soft resting-place for the shrubs. But until this high estate of perfection is attained, shrubberies are often kept clean by digging. The fleeter it can be done, and the more leaves dug in during the process, the better. This fleet digging is called pointing. It is performed by bending the back lower than usual, thrusting in the spade front to 4 inches deep, and then sending it along its whole length horizontally at that depth, and inverting the spadeful of shallow ground. By this mode of digging, the roots escape, and the surface is cleaned, enriched, and renewed at the same time. Proceed with the pruning and thinning of shrubs, and the removal of under branches of trees that may be growing over them. The pruning of ornamental trees is often necessary, not only to reduce their size, but to mould them into shape. The skilful pruner in this department is a trainer as well. He cuts to form, and the dead season affords the best facilities for both. The proper season for pruning tender evergreens is April. If cut severely, or entirely cut down now, they may be killed by the frost. But all deciduous trees should be pruned in winter. This is likewise the best time for the wheeling of compost and manure on to the flower garden or shrubberies. If we would have a full measure of beauty out of them, we must see to the making of compost and manure heaps, and their liberal application. Everything that has had life is capable of sustaining life. Therefore, any leaf, or blade of grass, or plant or flower, is capable of supporting other leaves, and plants, and flowers. There must be no waste in the garden; the rubbish-heap, and its enrichment, with excrementitious matters, such as sewage and solid manure, is the foundation of our summer glory. And now is the time to enlarge, compound, enrich, or transport the former to where it will speedily be wanted.

Alterations of Surface, &c., must be pushed forward as rapidly as possible. When heavy transportations of soil are requisite, great advantages may be reaped by doing heavy carting over soft surfaces during frosty weather.

PITS AND FRAMES.

Carnations, Picotees, Pinks, Auriculas, and choice *Polyanthuses* should be kept as cool and dry as possible. Guard against mice and slugs; give abundance of air in mild weather. During foggy frosty weather, damp is often very troublesome among those plants. Sprinklings of charcoal dust, dry ashes, or burnt earth are useful as checks or absorbents, or both.

Bedding Pelargoniums may have more warmth than such plants, but they must be kept dry during the dead season. Very little water will be needed at the roots, and the tops must not be wetted at all. Verbenas and other bedding plants need similar treatment. The great foe of all such plants in pits or frames in winter is damp.

Cinerarias keep near to the glass, and water freely. They will now be in full growth, and shewing flower, needing liberal supplies of water. They must not see frost, and should never be exposed to a lower temperature than 40 deg. *Calceolarias* are hardier, but should have similar treatment. Remove bulbs, violets, and forget-me-nots from these structures to the glass-house as they advance towards flowering. Destroy green fly with an instantaneous cloud, thick, dense, suffocating, of tobacco smoke, as soon as it is seen; attend to covering, watering, and giving of air with the utmost care, and remove every dead leaf immediately. Only by constant attention to such small matters, day by day, can the plants in pits and frames be safely wintered or give satisfaction when they come to bloom.

THE GLASS HOUSE.

The glory of the chrysanthemum will soon go out, and camellias, coronillas, cinerarias, Chinese primroses, violets, epacris, heaths, arums, Salvia splendens, &c., will be ready perhaps to take their places, otherwise the year will be ushered in almost flowerless. Where the one house is devoted to *Bedding Plants*, this is often the case. But by keeping it a little warmer, many of them may be pushed into blossom without permanently impairing their efficiency for next season. Old plants of verbenas and lobelias, lifted out of the flower garden, and placed in the glass house, often testify their gratitude for our care by a most profuse offering of flowers, which are highly valued at this season.

Pelargoniums.—Show, fancy, and variegated, must have the best place in the house. Light is useful for all plants. It is indispensable to the well-doing of these at this season. To draw them up weak now, is to ruin them. These plants thrive best in a temperature of 45 degs.; they should never be exposed to less than 40 degs.

Zonal Pelargoniums will be sinking into autumn or winter-tide. Withhold water gradually, and place these also in the eye of the winter sun. When partially matured, they may be dismissed to the pits and frames, or cellar for storage, until the beginning of February, when they can be cut back and started afresh; or, better still, when room is scarce, and successional plants have been provided, throw away the old plants when the last flower fades, and make a fresh start for next year's flowering.

Fuchsias expected to be in flower in May should be pruned at once. This will enable them to break afresh, and to be reduced and placed in smaller pots by the middle of January.

Beware of an excess of fire-heat during frosty weather. Remember that its application tends to drain the roots and tops of plants dry, and water more copiously accordingly. Sponge the foliage of camellias, daphnes, and all glossy or large-leaved plants, quite clean, before the blossoms expand. Nothing is more incongruous than the delicate beauty of pure flowers in juxtaposition with dirty foliage. Cleanliness is not only the parent of health but one of the most important constituents of the beautiful. Other elements of beauty come and go with the seasons, but this we have in our own power, and cleanliness ought to be an abiding guest in every garden, and especially within every glass-house. Dirt is always loathsome and distorting, but under glass it is like dust or gravel on the face of a mirror, it hides beauty, and magnifies its own deformity. Therefore see to it, that, whether your glass-house is large or small, richly or poorly furnished, it and its occupants are at least scrupulously clean.

Arboriculture.

ON ESTABLISHING AND CONDUCTING A REGISTER FOR FORESTERS, &c.

BY C. Y. MICHIE, FORESTER, CULLEN HOUSE, CULLEN.

IN the following report we shall endeavour to shew that the progress attained by the science of Arboriculture has of late years been such as to render necessary a different and improved mode of choosing or electing to high and important appointments those men on whom devolves the task of advancing the science of Arboriculture. Also, that the tests by which the qualifications of foresters have hitherto been tried are feeble, if not false; and the medium through which they are appointed to situations not unfrequently defective and objectionable; and finally, to shew a new and better plan, by the institution of a Register, whereby many of the evils and failures of the old systems may be superseded by the new.

Comparatively few men of any calling of profession in life, whether from nature, talent, or other favouring circumstances, are found truly qualified for filling, with honour and acceptance, any particular appointment compared with those inversely qualified; hence the necessity for a Register, that through its siftings and distinguishing operations the various classes may be so divided and separated, that all talented and duly qualified men may become not only known to each other, but especially to those whose interest it is to know them in a true and practical way, and thus secure their services.

Amongst the chief objects of the Scottish Arboricultural Society is that of advancing and promoting the science itself by all legitimate means within its province; and as the greatest power at command is vested in those men who devote themselves exclusively to its pursuits, their agency ought to be secured, and every assistance given them in its study and pursuit. And while it is the honour and happiness of many who are rich to drink pleasure at such a fountain as the study of Arboriculture affords, we would respectfully remind them that there are others (not a few) ready and willing to devote themselves exclusively to its pursuits, whose talents would command handsome pecuniary rewards in other occupations; and unless adequate inducements are bestowed, and something like due encouragement given to competent and qualified men, the science of Arboriculture must necessarily remain obscure, and in the rear of other sciences.

With the view, therefore, of bringing duly qualified men into contact with those who require and would appreciate their services, it is proposed to establish an institution termed a Register, under the management and auspices or the Scottish Arboricultural Society.

We shall endeavour, as plainly and concisely as possible, to shew some of the reasons that have led to the proposal to establish a Register, and the advantages calculated to arise to both employers and those wishing employment, from such an institution;—its constitution, membership, and general working arrangements.

1. The first reason we shall assign for establishing a Register is the great amount ot delay, waste of time, and expense experienced by both masters and men. To the former, when in immediate want of a duly qualified man, and to the latter, when seeking an employer or situation, neither party knowing where or to whom to apply for guidance in the matter.

2. The practice ot advertising in newspapers, though common, is so fraught with all that is disagreeable and unsatisfactory, that many employers who would gladly accept of, and adequately remunerate, a duly qualified man, would rather retain the one they l

though *unduly* qualified and unsatisfactory, than undergo the disagreeable labours unavoidably connected with advertising.

3. The present as well as the past practice of choosing foresters for situations is generally done in one of three ways, viz., by correspondence done in writing; by intermediate agency or proxy; and sometimes by personal interview. With regard to the first mode, it is objectionable on account of the *test* of qualification being based too much on the merits or qualifications of letter-writing; for although the gift or acquirement of writing is by no means at variance with, or antagonistic to good forestry, yet it is so different, and apart from it, as to establish the fact that many men who compose well, in general, and display elegant hand-writing, are unqualified in a true and practical sense. Hence, well written letters, however good and commendable as such, are yet to be regarded as improper tests as to the essential qualifications of practical men.

It not unfrequently happens that one man's principal, if not his only talent, lies in writing, while the talents of another (and as applicable to forestry, by far the most important) consists in observation, energy, perseverance, construction, and handicraft, none of which are either represented or indicated by hand-writing; hence, when engagements are effected through writing, and much relied upon *as an index of qualification*, disappointment is the general result.

Selection by proxy or agency, which is the most common and general of all modes, has several advantages [illegible] of choosing from [illegible] applications [illegible] principally ob[illegible] [illegible] on account [illegible] few of those w[illegible] [illegible] being themsel[illegible] [illegible] and co[illegible] [illegible] details of forest[illegible] [illegible] select fo[illegible] [illegible] agree with thei[illegible] [illegible] which [illegible] [illegible] unobserv[illegible] [illegible] accomplishm[illegible] [illegible] en[illegible] throughout the country, and both parties have hitherto extensively patronized it.

A very general practice with foresters who fall out of situations, is either to put themselves in communication with nurserymen by correspondence, or to endeavour to secure their influence by going as workmen into their nurseries, so as to be under their eye and kept in remembrance. The practice of foresters applying to nurserymen to procure for them situations is not only an antient but, in many respects, a useful one, and which we would be sorry to undervalue or despise. The system, however, of nurserymen agency, if possessed of much that is good, is also attended with evil; and without enumerating its disadvantages we shall briefly state that what is now required, both by employers and those seeking employment, is far above and beyond anything which nurserymen, either as individuals or firms, can supply. Doubtless nurserymen are in general more before the public than foresters; and some old-established firms have long maintained such important positions and honourable connexions as to constitute them worthy of the confidence reposed in them in the past; but, as individuals and firms, during the course of time have changed or become extinct, and the demand for skilled forestry becomes more urgent and general, a public desideratum has come to exist which they cannot supply for this country, far less for relationships abroad. The best mode of choosing foresters we shall notice is, by personal interview and conversation, between the employer and the person seeking engagement, which differs [illegible] that of engagement through agency, [illegible] person most deeply concerned, or [illegible] in the transaction, being a party to [illegible] advantage gained by the employer [illegible] personally in the engagement [illegible] that of self-satisfaction at having seen and conversed with the person with whom he is afterwards to be in contact less or more frequently; and it is an element in human nature [illegible] to choose its own objects, whether of [illegible]

[illegible] employers are therefore sufficiently [illegible]ted and duly qualified to discern, discrimind judge of the man and his capabilities, is this mode of choosing good and ctory; but as it is frequently the case he class of employers requiring foresters h attainments are by no means the most to have gone into the details and cal operations of forestry, hence the nt occurrence of unqualified men pas- their examination, and thus obtaining ntments which they were incapable of rly filling.

m the preceding modes, it will be seen ery inefficient all are in accomplishing nd and object they undertake; hence risen the necessity for establishing a ter for their better accomplishment.

Register, which is the new mode pro- , will, we anticipate, possess all the tages requisite for placing the most ing and best qualified men first on the as to meet with ready engagements to ons worthy of their abilities, and to re- adequate remuneration for their superior cations. It will also classify and arrange mbers in such a way that any employer hoose, without difficulty, the sort of man quires to fill any particular situation, he highest to the lowest in the list.

means of the Register, advertising for rs or situations will be no longer sary; and the trouble and expense there- onnected be entirely avoided.

influence of nurserymen will, in the old be cancelled, but in the new will be y increased, and their responsibility rtionately exalted.

the Register, those duties usually devolv on one individual in examining candi as to their proficiency, morality, &c., evolve upon a committee, appointed by, esponsible to the Scottish Arboricultural y, and which committee will comprise nost experienced and accomplished rs the Society appointing them can and. The advantages of a committee hat of a private individual, in performing duties as examining candidates, cannot e over-estimated.

have indicated some of the reasons for ishing a Register, by shewing that the present existing system is incapable of accomplishing what is required of it, either as respects employers or those wishing for employment. By the old system, no proper facilities are afforded for properly qualified and deserving men finding their place of merit and desert, under worthy employers, to the prevention of others not so qualified or deserving.

While many difficulties are experienced on the part of persons resident in this country, in finding such men as they require to fill local situations, greater difficulties still are experienced by foreigners in procuring suitable persons for situations abroad; and as the practice of engaging Scotch foresters for Germany, India, &c., is becoming more and more general, facilities must be provided to meet their requirements; and these, it is firmly anticipated, will be found under the registry system, since by it any person, whether at home or abroad, by addressing a letter to the Secretary of the Scottish Arboricultural Society, and therein indicating what salary he is prepared to give, can be provided with the most suitable person to fill the situation which the list of membership will afford, and this at a mere nominal expense.

No plan however well devised, or scheme however complete, but may be shewn to be imperfect; nor is the proposed Register an exception to the general rule in the latter respect.

It is not without regret that we find the adoption of the Register opposed by nurserymen, on the ground that it is calculated to detract from their sphere of influence and power. We would, however, seek to assuage all fears on this point, as the adoption of the Register will not in any important and true sense diminish their influence, but, on the contrary, may, according *as they will it*, add very materially to their influence and honour.

THE REGISTER.

In order to the building of a fabric, it is necessary to have the materials which go to construct it, and before we have an established Register, we must have those essential elements which compose it; and beginning with the office-bearers of the Scottish Arboricultural Society as its nucleus, we would proceed as follows:—

1st, The President of the Scottish Arboricultural Society to be its President, if president is required.

2nd, The Secretary, who shall keep the book for enrolment and minutes of procedure, sign certificates, &c., to be the Secretary of the Scottish Arboricultural Society.

3d, The Committee, who shall consist of three members chosen from the list of the General Committee, or appointed at the next annual meeting, to be composed of two practical foresters, and one scientific or distinguished literary man. This Committee to be composed of men residing as near Edinburgh as possible, and who may hold quarterly meetings at a place and time to be afterwards named, for the purpose of examining candidates for registry, examining their testimonials, corresponding with them, and *de facto*, doing everything required in order to ascertain full particulars and antecedents of all persons seeking testimonials of *eligibility for registry*. We would here also recommend that this Committee be invested with power to appoint *other committees* to act in emergencies, especially in distant localities, when the applicants could not, on account of distance, go to Edinburgh to be examined; and such subordinate committees may be either appointed for the year, or chosen only to meet extraordinary emergencies, and thereafter retire. Upon the proper discharge of duty on the part of such committee, or committees, depends in a great measure the beneficial and successful results of the registry.

4th, The members, or persons who are eligible for registry, shall consist of such only as conform to the prescribed rules, which rules may be published along with the Transactions, and separate copies kept and sold by the Secretary to any person who may apply for them.

5th, In addition to foresters, it is also here proposed to open the Register to hedgers, wire-fencers, saw-millers, estate carpenters, rustic wood workers, &c.; but the condition of being a member of the Scottish Arboricultural Society need not be binding on others except foresters.

6th, Persons examined by the appointed Committee, and found *qualified according to their class*, shall convey to the Secretary their respective schedule A (see Appendix), filled up and signed by the Convener of Committee, at sight of which the Registrar shall grant the applicant another schedule or certificate B (see Appendix); and this certificate will require always to be produced, or held as produced by a proxy, when he desires his name put upon the Register.

7th, The certificate given by the Secretary shall enable its possessor to register, without further trouble, at any time within two years from date of certificate; but any person seeking registry beyond the period of two year will, in addition to that of producing hi original certificate B, require to produce supplementary schedule C, filled up accordin to prescribed form, by two members of th Scottish Arboricultural Society, other tha relatives.

8th, A scale of charges will be resolve upon by the Scottish Arboricultural Society and the Registrar to impose them as persona remuneration for all duties discharged i connexion with the Register, of which th following may indicate the scale:—

1. Certificate signed by Secretary .	0s	6
2. For enrolling in Register . .	1	0
3. Letters, one page of note 2d., including stamp, and for each page additional	0	1
4. For each engagement (paid by employer)	1	0
5. For each name or address for reference copied from the Register and sent, in addition to stamp	0	1

9th, It may be left optional to the person entering his name in the Register, whether his own or that of a patron or friend's name, be entered for first reference; by this toleration being given, it will add greatly to the popularity of the institution, by the privacy which it secures; as some persons would prefer the name of a respectable nurseryman, factor, o other being placed in the Register in preference to their own being put there. Some persons, on the other hand, would prefer their own name put in preference to that of anyone's else. This, however, being a rule and provision, it prevents any person who might, through mere curiosity or baser motives, pay the required amount for the pleasure of looking into the register to see who were seeking, or requiring situations; but on its becoming known that representative names (for reference) stood there as well as others, few would care to pay for such an indulgence.

10th, Any proprietor applying to the Registrar for a forester or other person requires to state the highest amount of salary he is prepared to give, and on the Registrar receiving such information he at once copies out all the names of that class, including address, and despatches the list to the person applying, leaving it to him to make his selection. The Society being so far a guarantee that every man upon the list is duly *qualified according to his class.* And the person to whom the list is sent pays, in addition to stamps, one penny for each name in the list sent him. If thirty names are sent, he pays 2s. 6d., and so on.

With respect to the persons whom the Register contemplates accommodating and benefiting, we would denominate and classify as follows:—

FORESTERS.

We propose arranging and classifying foresters in four divisions, namely:—

1st, First-class men at minimum salary of £100 per annum.

2d, Second-class men at minimum salary of £80 per annum.

3d, Third-class men at minimum salary of £50 per annum.

4th, Fourth-class men at minimum salary of £40 per annum.

The conditions and rules applicable to each class are as follows:—

First-class Foresters are subject to the following conditions, namely:—

1st, To be a member of the Scottish Arboricultural Society.

2d, To have either been apprenticed at least three years, or as a set-off against this, to have been six years at the business; altogether, nine years of apprenticed, or twelve years if not apprenticed.

3d, To be at least twenty-seven years of age, and in good health.

4th, To produce satisfactory certificates from his present and previous employers.

5th, To produce favourable testimonials from three foresters (other than relatives), members of the Scottish Arboricultural Society.

6th, To give references to other three members of the Scottish Arboricultural Society (not relatives), in order to answer questions put by the Committee, verbally or in writing, as they think proper.

7th, To shew to the Committee all original certificates, and answer any questions relative to their character, &c.

8th, Minimum salary per annum, including house and garden, £100.

SECOND-CLASS FORESTERS.

1st, To be a member of the Scottish Arboricultural Society.

2d, To have been either apprenticed three years, or as a set-off against the apprenticeship, six years at the business; altogether, if apprenticed, six years; if not apprenticed, nine years.

3d, To be not less than twenty-five years of age.

4th, To produce satisfactory certificates from his present and past employers.

5th, To be recommended by two foresters, members of the Scottish Arboricultural Society (other than relatives).

6th, To give references to other two members of the Scottish Arboricultural Society (not relatives), to answer questions to the Committee, verbally or written, as they think proper.

7th, To answer any relevant questions put by the Committee, shew their original certificates, &c.

8th, Minimum annual salary, including house and garden, £80.

THIRD-CLASS FORESTERS.

1st, To be a member of the Scottish Arboricultural Society.

2nd, To have been apprenticed three years and one year a journeyman (four years in all), or if not apprenticed, to have been at least six years at the business.

3d, To be recommended by one member of the Scottish Arboricultural Society (not a relative).

4th, To give reference to one other member of the Scottish Arboricultural Society (not a relative), who will answer any required questions to the Committee, verbal or written.

5th, To be not less than twenty-three years of age.

6th, To be examined by the Committee and give them satisfaction on all points both as to qualifications and morality.

7th, Minimum annual salary, including house and garden, £50.

FOURTH-CLASS FORESTERS.

1st, To be a member of the Scottish Arboricultural Society.

2d, To have been at least three years at the business or wrought as a woodman.

3d, To be recommended by one member of the Scottish Arboricultural Society.

4th, To be at least twenty years of age.

5th, To be examined by either the principal or sub-committee, and give them satisfaction as to competency for a foreman's duties, or other subordinate appointment.

6th, Minimum salary, exclusive of perquisites, £40 per annum.

II. APPRENTICE FORESTERS.

In forestry, as in other departments of trade and business, apprentices are frequently required; and it has hitherto been a source of difficulty, both to master foresters and young lads who wish to enter the business, to meet with each other in order to form engagements; and it is in consideration of these difficulties and inconveniences that we propose appropriating a column in the register for their accommodation. The conditions of which are as follows:—

1st, To be not less than fifteen years of age.

2d, To produce a teacher's certificate as to scholarship, &c.

3d, To give references to one member of the Scottish Arboricultural Society.

4th, To be recommended by one member of the Scottish Arboricultural Society.

5th, To submit to engagement for a period of at least three years.

6th, To satisfy the Committee, or subcommittee, on all points relating to character, scholarship, &c.

7th, To accept of wages for first year at three-fourths of that paid to the ordinary workmen, and to advance at the rate of 1s. per week annually throughout the term of engagement.

III. HEDGERS.

Hedgers are a class of men whose services are indispensable on almost all important well-conducted estates in this country, and a class with whom considerable difficulty is often experienced in order to get the proper man for the proper situation. Upon one estate the requirements of the hedger are much work, and roughly performed, while upon another it is quite the reverse of this. In order, therefore, to distinguish and set apart, as far as practicable, the two classes, we have so classified them in the register as follows, and appended the following conditions:—

FIRST-CLASS HEDGERS.

1st, To be recommended by two members of the Scottish Arboricultural Society.

2d, To give references to two other members of the above Society.

3d, To be not less than twenty-six years of age.

4th, To produce testimonials from his present and past employers.

5th, To pass an examination by the appointed Committee.

6th, Minimum annual salary, with house and garden, £40.

SECOND-CLASS HEDGERS.

1st, To be recommended by one member of the Scottish Arboricultural Society.

2d, To give reference to one other member of the above Society.

3d, To be at least twenty-two years of age.

4th, To have been at the employment for at least five years.

5th, To produce satisfactory testimonials from his present and past employers.

6th, To pass an examination by the appointed Committee.

7th, Minimum weekly wages, without perquisites, 15s. per week.

IV. SAWMILL WORKERS.

This is another important class of men, less or more connected with forestry and estate-work generally. Sawmillers, like hedgers, very naturally divide themselves into two classes, each differing in some important respects from the other. Upon estates where foreign, as well as wood of home-growth, is manufactured for important buildings, first-class sawyers are required, and high wages afforded; but upon estates where the sawing is confined chiefly to young wood for pailing purposes, which does not require much nicety in sawing, secondary men may do, at lower wages.

FIRST-CLASS SAWYERS.

The conditions necessary to be attached to the above class of men in order to admit them to the privilege of registry, are as follows:—

1st, To be recommended by two members of the Scottish Arboricultural Society.

2d, To give reference to other two members of the above Society.

3d, To have been eight years at the business, and practised in the sawing of foreign as well as home-grown wood.

4th, To produce testimonials from present and past employers, as to competency, morality, &c.

5th, To pass examination by the general or sub-committee.

6th, Minimum salary, £40 per annum, with house and garden.

SECOND-CLASS SAWYERS.

1st, To be recommended by one member of the Scottish Arboricultural Society.

2d, To give reference to one other member of the above Society.

3d, To have had five years' experience in sawing generally.

4th, To produce certificates from present and past employers, as to competency, morality, &c.

5th, To pass examination by the spe
or sub-committee.

6th, Minimum weekly wages, without p
quisites, 15s.

V. ESTATE CARPENTERS.

This is another class of men whose servi
are indispensable upon any important esta
in proportion to their usefulness, so
they difficult to procure, at least at the tin
by those requiring them. According
the extent of the estate, and importance
the work required, so vary the necess
qualifications of the men; and in consid
ation of these requirements, we propose
divide them into two classes, with conditio
as follows:—

FIRST-CLASS ESTATE CARPENTERS.

1st, To be recommended by two memb
of the Scottish Arboricultural Society.

2d, To give references to other two me
bers of the above Society.

3d, To have had ten years' practice at t
trade.

4th, To produce satisfactory testimoni
from present and past employers.

5th, To pass examination by the gener
or sub-committee.

6th, Minimum weekly wages, with hou
and garden, and maintaining his own too
20s.

SECOND-CLASS ESTATE CARPENTERS.

1st, To be recommended by one memb
of the Scottish Arboricultural Society.

2d, To give reference to one other memb
of the above Society.

3d, To have had at least five years' expe
ence at the trade.

4th, To produce testimonials from pr
sent and past employers, as to competenc
morality, &c.

5th, To pass examination before either t
special or sub-committee.

6th, Minimum weekly wages, with hou
and garden, and maintaining his own too
17s.

VI. RUSTIC WOOD WORKERS.

According as the taste, habits, and requi ments of the community vary and change, so with them must change other things, though remote and distant from them. That which may be accepted as good taste now, may be rejected a few years hence, and *vice versa.* In nothing is this more manifest than in the rapid and intensifying desire for rustic ornamentation and adornment, and although iron is made to imitate wood, yet for many purposes the latter is much preferred, and in nothing more so than in seats and chairs, which, when made of iron, are cold and comfortless compared with wood.

The increasing demand for rustic wood work has induced many men to devote themselves entirely to it as a select and distinct branch of business; and it is with a view to bring together those whose mutual interest it is to meet each other at the Register-office, that we have devoted a column to the above class, not deeming it necessary however, in the meantime, to constitute more than one class; and the conditions to be observed are as follows:—

1st, To be proposed by a member of the Scottish Arboricultural Society.

2d, To give reference to one other member of the above Society.

3d, To produce testimonials from present and past employers, as to efficiency, good conduct, &c.

4th, To pass examination either by the principal or subordinate Committee, and receive certificate from Registrar.

5th, Minimum weekly wages, with house and garden, providing and maintaining tools, 15s. to 18s.

[illegible]

couragement, provided for them a place in the Register. Believing that only first-class wire-fencers would be sought after, and that such only would think of placing their names in the Register, with a view of obtaining a better position, we think it is only necessary to provide for one class, with the following qualifications, namely:—

1st, To be recommended by one member of the Scottish Arboricultural Society.

2nd, To give reference to one other member of the above Society.

3d, To produce certificates from present and past employers, as to efficiency and good conduct.

4th, To pass examination by either Committee.

5th, Wages per week, with house and garden, from 15s. to 18s.

GENERAL REMARKS.

1st, The advantages which the Scottish Arboricultural Society, as such, will derive from the Register are great and manifold. It will increase the number of its members, make the Society more public and better known, increase its influence and power, and gain for it celebrity, by sending forth the best foresters and others in the land to all parts of the world at large.

2d, It will bring men of all classes together, and allow them to interchange sentiments and opinions upon all subjects with which they have to do, and thus stimulate and animate each other.

3d, The advantages of the Register to individuals cannot, we believe, be over- [illegible] the best men will be [illegible] ranks, and thus obtain the [illegible] opportunity of obtaining the [illegible] desirable situations. The [illegible] required to go through [illegible] registry, correspondence, [illegible] recommendation to many who [illegible] circumstances, and favour- [illegible] respect, with the incon- [illegible] mode of advertising. The process and forms to be gone [illegible] by persons in order to qualify them [illegible] registry are studiously made as simple as is compatible with the necessary rules of examination, which are designed to test qualifications, character, &c., and with the justice demanded by deserving and qualified men and the public, in restraining and preventing the unqualified and undeserving from entrenching upon ground rightfully denied them.

5th, By the Register there is secured that amount of secrecy and privacy, which most people regard as almost sacred, and which is especially desirable in all such matters as relate to exchange or appointment to situations of trust and honour. So private, indeed, is the registry of persons that any one examining the list could not, by what is seen there, know who the persons are who are in quest of situations, because the address in the Register is only that which is the index by which to know who the person is whom it represents. It may be the name of the person, *bona fide*, who seeks engagement, or it may be the address of a nurseryman, who allows his name to be placed in the Register on behalf of a person so desiring him, who, on being requested by any one wishing to make an engagement of a forester or other, receives the true address; at same time, he whose name is in the Register is held accountable to the Society, to a certain extent, for the character of him whom he represents; and should he fail to give satisfaction, at any time within two years from the time of engagement, such delinquencies are read over as against the proxy, and thus so far detract from his influence in future. On the other hand, as all names of those persons appointed to situations through the Register will be read over at the two succeeding annual meetings, where they give satisfaction, this also is put to the credit of their proxies, and thus just so much enhances their influence in the future.

6th, By means of the Register none but properly qualified men will be allowed to enter situations; hence confidence in the Society will be felt by proprietors, and from them aid and influence will be secured.

7th, The greatest possible despatch can be effected by means of the Register. A servant of any class may be procured and engaged within a very brief time, and at very littl
trouble or expense on the part of those e
gaging him.

8th, While the benefits of the Register wi
be enjoyed by all parties interested at hom
they will be no less so by others at a distanc
or in foreign countries. As in India
Germany, both conservators and foresters ma
participate in the good. The conservat
may apply for a forester and be supplie
with the best whom the Scottish Arbor
cultural Society can command, without labou
inconvenience, or expense, beyond writing
single letter, and perhaps half-a-crown or s
and the forester in Germany or India ma
with like ease and convenience, obtain
situation either in this or other countries.

9th, All applications, whether for Registr
or for persons for situations, to be made t
the Secretary of the Scottish Arboricultur
Society. On the application of persons f
registry who have not passed examination,
will devolve upon the Secretary to put the
in communication with the Committee'
correspondent, and, after passing examinatio
the Secretary will give them their respecti
certificates, and which entitles them, not onl
at once to obtain Registry, but is of itse
equally valuable till the end of two years whe
as already stated, the certificate will requi
to be supplemented by the filling up of
schedule (see Appendix C.) by two membe
of the Scottish Arboricultural Society.

10th, Any person having, through impr
dence or misconduct, forfeited his title t
Registry shall, according to his class, b
again admitted on getting schedule C (se
Appendix) properly filled up, so that thos
who fall need not thereby be helpless or r
main cast off.

11th, It may be objected to the precedin
conditions, that they are too strict and excl
sive; but to this it may be answered that u
less there are exclusive clauses, and th
Register be upon somewhat conservativ
principles, the better results of the Registe
will fail of attainment, and thereby superi
men would eschew it, just as inferior one
would enter and enjoy it.

12th, In no case will it be admissible f relations, nearer than cousins, to take any part in giving evidence, or in the recommendation of candidates; and if it can be proved that any person is influenced or induced by money or other species of bribery to give evidence for advancing or promoting any candidate, such persons shall be suspended from all privileges of the Registry during the Society's pleasure.

13th, While the certificate held by any member entitles him to Registry as a first, or second, or other class man, he is not bound to register in that class, but is at liberty to do so in any subordinate or lower class than that to which his certificate entitles him, but no members can register in a class higher than that mentioned in the certificate.

14th, The examples given in the appendix as applying to first-class men apply equally to all other classes, save that suspension for misconduct need not be so long exercised upon them.

15th, The convenience of having the whole resolved into classes determined as near as practicable, by the salary they are prepared to accept, is very considerable, as in the case of a gentleman, writing for a forester, stating the salary at between £60 and £70, the third-class list would be sent him to choose from; and should another state the salary at between £80 and £95, or even £99, he would be furnished with the second-class list, and so on with all the others; thus the list is in each case reduced to near uniformity; whereas, were the whole sent at once —including both £100 and £40 men—the list would be too long, and the expense and labour of copying and sending the list would [illegible] very objectionable to all parties [illegible]

investigation of Candidates applying for Registry, find John Johnston, Forester of Castle Alpine, duly qualified to be registered according to the rules laid down by the above Society.

(Signed) D. B. ROBERTSON,
Convener of Committee.

THE SCOTTISH ARBORICULTURAL SOCIETY'S REGISTER.

August 3, 1870.

Certificate **B.**

No. 1.—*First-class Foresters.*

This is to certify that John Johnston has successfully passed his examination by the appointed Committee, and is found to be duly qualified for admission to the full privilege of Registry as a First-class Forester now or at any time within two years from this date.

(Signed) JOHN SMITH,
Registrar.

THE SCOTTISH ARBORICULTURAL SOCIETY'S REGISTER.

Schedule **C.**—Supplementary Schedule.

August 3, 1872.

Questions to be answered (printed form).

1. Do you know John Robertson, Forester of Castle Alpine? *Ans.* Yes.

2. Have you known him intimately during the past two years to this date? *Ans.* Yes.

3. Is he to the best of your knowledge sober, and has he been so during past two years [illegible] have always considered him [illegible]

[illegible] your knowledge [illegible] *Ans.* Yes.

[illegible] at the present [illegible] in such a state [illegible] fully and completely [illegible] responsibility? *Ans.*

JOHN BLACK, Castle Oak.
JAMES WHITE, Castle Ash.

The Stable.

THE COST OF UNRULY ANIMALS.

IN persuading farmers to keep quiet animals only, we do not propose to make estimates of the amount of wheat, corn, or oats, which they tread down and destroy when they break into cultivated fields, nor the time in driving them out when the owner or his men happen to be particularly busy, nor the lessons in bad morals which such marauders teach to all the other animals of the farm, nor the wear and tear from vexation to which the mind of the placid owner is ever liable. These sources of serious damage are well known, and are unfortunately too familiar by experience to many farmers.

Omitting at the present moment all these considerations, we wish to invite attention for a moment to another source of cost and disadvantage which such animals occasion, and which may be reduced to figures—a mode of estimate which we always like to resort to where practicable. This is the necessity and cost of high feeding.

The older members of our community will remember well the times when everything that grew from the soil had to be protected by high and strong barriers. Heavy rail fences, at least 6 feet high—we have often seen them as high as 7—and well "staked and ridered," would scarcely restrain the rampant steers and bulls, or the vaulting colts which had the range of the fields. The cattle consisted largely of the long-legged and swift breeds. These have been greatly improved; better farming has given better feed, and they have less inducement to leave their comfortable enclosures. We can perceive a decided change within the last thirty years in the height to which it is deemed necessary to build fences. At the same time, there are fewer inroads made by animals into cultivated crops.

The figuring which we make, is to shew the cost which a single unruly beast may make to its owner, to say nothing of his neighbours'. Four feet is a sufficient height for any orderly and well-fed animal; but we occasionally see strong board fences, built 5½ to 6 feet high, as a protection against fence-leapers. What is the additional cost? Suppose the pasture contains but 10 acres—the least circumference of which must be 160 rods, or half-a-mile. The 320 posts must be nearly double in size; the addition of boards will be at least 1600 feet. The post-holes must be dug 6 inches deeper. The additional cost of fencing, to keep one wild animal, will be:—

5d. each added to 320 posts, for strength	£6	13	4
1600 feet of boards, additional . .	5	0	0
Extra digging of 320 post-holes, 2½d. each	3	6	8
Extra work setting posts, making fence &c.,	4	3	4
Total	£19	3	4

Nearly £20 special expenditure to keep an unruly animal in a 10-acre enclosure, without estimating the other expenses incident to its peculiar habits. But this is only a small part; for every farmer who adopts a rotation changes his pasture fields, and, before the work is ended, the cost may run up to £50 or £60.

The best economy for every owner of such cattle is to dispose of them at once to the drover, or to convert them to beef. Keep only those that are quiet and gentle, and a great deal of annoyance will be obviated. If horses or colts are not disposed to remain in the fields where they are put, they should invariably be kept in stables.

The Dairy and Poultry-Yard.

HOW TO MAKE MORE BUTTER.

MR C. L. SMITH of Chatanqua, New York County, writes:—

From observation, I believe too many butter-makers do not skim as deep or churn as much milk as they ought. I hear them say often that they don't like to get so much milk, or sour cream, in with the cream. It is a common practice for most butter-makers to have a skimmer that is perforated with holes, that the milk may pass through into the pan from which the milk is being taken. If any one has a better reason for not skimming deeper, I shall be pleased to hear it, and herewith give my reason why, I think, we ought to skim deeper and churn more milk with the cream. First, there are but few dairy houses so far removed from the odours of the kitchen swill-pail, or barrels, or some decaying vegetable matter, as to keep the cream from absorbing odours that injure the flavour of the butter; and the cream must first receive, or have these odours pass through it, before they can reach the milk, as it is most exposed.

The milk must therefore be most pure, and, if churned with the cream will aid in taking up the odours from the butter. By churning only the cream the [illegible] the [illegible] [illegible] [illegible] directly applied to them than would be the case if milk was mixed with the cream.

There are times when milk sours before all the cream is up; yet the milk must be nearly, if not quite as good, from the same cow that is being fed the same feed, in a warm morning as it is in a cool morning. But we often get twice the amount of cream in the cool days that we do in warm days, and the quality is better. Take, for instance, the 24th of August, a hot sultry day, the cream hardly paid for the labour. Now, take the 26th of the same month, 1870, a good cool day, that gave a nice yield of cream. Is it to be supposed that there is that difference in the milk produced from the same cows on those days, when the cows were fed in the same pasture, that there was in the amount of butter made from their milk by skimming the cream only?

I have thought that when the milk is brought in in a heated condition, and placed in a room, that perhaps many of the butter globules were exploded by the heat, and that they mingle with the milk, like alcohol with water, but to churn all the milk would be to get more butter. I have been using Dr A. F. Jennings' Patent Milk Pan this season, and [illegible] excellent thing for cooling milk [illegible]

The Apiarian.

MORTALITY AMONGST BEES.

I AM in receipt of letters from several individuals, who, having lost all their bees during last winter, express themselves as somewhat discouraged, believing themselves to be the only unfortunate ones. For the benefit of such, I would say that last season was an extraordinary one, such as we have not had for many years.

The entire season being cold and wet, bees did not lay in sufficient stores for winter use. It will be recollected that winter set in uncommonly early. It was also late in spring before bees could be brought out from their winter quarters and placed on the summer stands. Hence they were closely confined to the hive much longer than they generally are, requiring larger winter stores than usual, while the cold and wet season prevented their laying in even an ordinary amount. The result is, there has been a fearful loss of bees throughout the country, by far exceeding anything of the kind for years, and those few who think themselves the only unfortunate ones, may console themselves with the thought—if consolation it is—that nearly all beekeepers have suffered a similar loss, many having lost their entire stock, others one-third or one-half, and nearly all losing some. I am informed of one man who went into winter quarters with one hundred stocks, and came out with only fourteen, and those in a weak condition. Others, again, with forty stocks, came out with seventeen.

Many supposed their stocks had sufficient stores, and yet they were found dead in the spring. We can only account for stocks being heavy, and yet proving short of honey, by their having gathered largely of pollen, bee-bread, and by the honey being watery, making hives weighty. It will require some time to make up the loss, and every bee-keeper should renew his determination to keep only strong stocks.

The present season bids fair to be a good one. Bees are now doing well, and swarming commenced as early as usual, though the scarcity of honey consequent, to a great extent, on the dry weather about the last of May, caused the bees to kill off their drones in many localities, which will retard swarming and the breeding of queens somewhat.—*J. H. Thomas, in the Albany Cultivator.*

The Naturalist.

WHEAT AND BERBERRY RUST.

(*From Nature.*)

THE theory has long been prevalent among practical agriculturists, that the proximity of berberry trees produces rust in wheat. Men of science, unable to trace herein the sequence of cause and effect, long derided the idea, and placed it among the prejudices of the agricultural mind. The facts of the farmer have, however, been too strong for the science of the botanist, and experience has won the day over theory. Let us trace for a moment the history of the inquiry. The first reference to the injurious influence of the berberry on corn, appears in Krunitz's "Encyclopædia," published in 1774. Marshall, in 1781, speaks of the berberry having been extirpated in Norfolk for this reason, and Schopf, in 1788, mentions the same idea as prevalent in New England. Other writers of the same period give similar testimony; and, in 1806, Sir Joseph Banks writes thus in the "Annals of Botany:"—"It has long been admitted by farmers, though scarcely credited by botanists, that wheat in the neighbourhood of a berberry bush seldom escapes the blight. The village of Rollesby, in Norfolk, where berberries abound, and wheat seldom succeeds, is called by the opprobrious appellation of 'Mildew-Rollesby.' Some observing men have lately attributed this very perplexing effect to th[illegible] arina (pollen of the flowers of the berberry, which is, [illegible] degree, th[illegible] presumed [illegible] however [illegible] the very subj[illegible] [illegible] sitic fungus [illegible] the rust [illegible] German fungologist, De Bary, within the last few years, to establish the truth of his theory, and to prove the existence of the phenomenon of Alternation of Generation among Fungi. The researches of Steenstrup and others have made us familiar with this remarkable phenomenon among the lower forms of animal life, but had hardly prepared us to meet with it in the vegetable kingdom. It appears probable, however, that the phenomenon is by no means uncommon here also—affording another instance of the law that it is in their lowest forms that the animal and vegetable kingdoms approach one another most nearly—and that whole tribes of fungi hitherto considered distinct are but different phases of one another. This known orange-red spots so common on the leaves of the berberry, are produced by the Æcidium berberidis, while the rust of wheat and other cereal crops, but found equally on some other species of grass, as the common couch-grass or Triticum repens, is the Puccinia graminis. In the volume for 1865 of the Monatsberichte der kon. preuss. Akademie der Wissenschaften zu Berlin, is a paper by Dr De Bary, giving an elaborate account of his experiments on the propagation of these two fungi, in which, if his experiments are reliable, he nearly proves the correctness of Sir Joseph Banks' suggestion that they are one and the same [illegible] the experiment was tried, with due [illegible] inoculating the leaves of the ber[illegible] the Puccinia, the result [illegible] production, not of the same fungus, [illegible] Æcidium, while the sowing of the [illegible] fungus on the leaves of couch [illegible] versely the Puccinia. By [illegible] other fungus on the plant [illegible] parasitic, he failed alto[illegible] produce the same plant; and this [illegible] generation may serve to account [illegible] the fact, which has often been noticed, that [illegible] apt to appear not in successive but in [illegible] years on the same crop.

It is unfortunate to find that in a work bearing a considerable amount of scientific authority among agriculturits, and published in the same year, 1865, Professor Buckman's "Science and Practice of Farm-cultivation," the theory which thus appears to have been proved on the Continent was scouted in the following terms:—"Æcidium berberidis is here referred to, from an opinion prevailing, that it is the cause of rust or mildew in wheat. We can no more believe that the berberry rust would produce rust in wheat, than the rust of any other plant would do so. Still, that wheat growing under a berberry hedge may be more blighted than the rest of the field is quite true, and so it is with wheat growing under any kind of hedge." Mr Buckman fails entirely to grasp the argument, which is not that wheat "growing under a berberry hedge" is attacked by rust, but when growing in the proximity of a berberry tree, say at the distance of a field's breadth. Nothing is more certain to weaken the hold of science over practical men, than when men of science, in order to support their own theories, set themselves systematically to deny well-known facts. We therefore greatly regret the decision at which it is understood the Council of our Royal Agricultural Society has arrived, to refuse a thorough investigation of the subject which has been urged upon them, calling in the assistance of experienced men and the most able fungologists of the day. This is not the way to command the confidence of practical farmers.

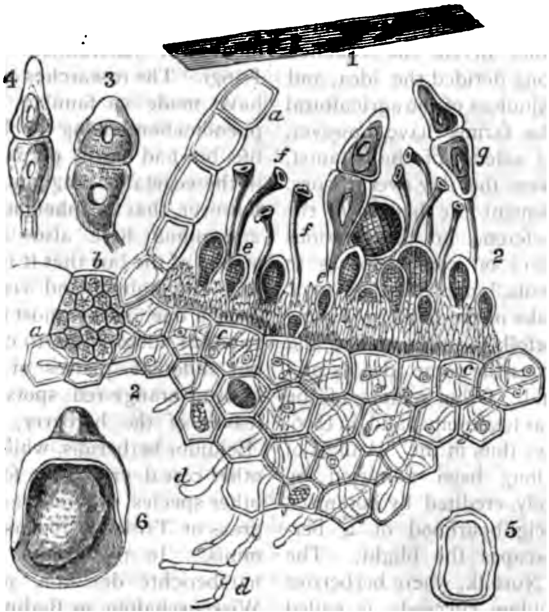


Fig. A.

Puccinia graminis, Pers. 1. Leaf of grass, with mildew, natural size. 2. Section of the leaf, with a patch of mildew and rust; *a*, epidermis of the leaf; *b*, bast-cell-nerves; *c c*, outer layer of cells of the leaf, on which the parasite rests; *d d*, mycelium; *e e*, young and old spores of Cæoma lineare; *f f*, stalks from which the spores have fallen off; *g*, spores of the Puccinia. 3, 4. Spores. 5. Section of the wall of the lower spore-cell. 6. Longitudinal section of the upper spore-cell with the spore-nucleus. (2—6 magnified.

We commend to the consideration of the Royal Agricultural Society, the conduct of a railway company in the south of France, described in the *Bulletin de la Societe Botanique de France* for January of this year, to which we have already alluded (see *Nature*, vol. i., p. 516). In the commune of Genlis, Department of Cote-d'-Or, a berberry hedge was not long since planted on one of the railway embankments; when immediately the crops of wheat, rye, and barley in the neighbourhood, became infested with rust. The complaints of the farmers caused the appointment, by the company, of a commission to investigate the subject, who reported, after a full inquiry, that wherever the berberry was planted, the cereals were more or less attacked by rust; where they were absent, the crops were free from disease; and that the planting of a single berberry bush was sufficient to produce the rust where it had never appeared before. The railway company's own commission held t c pensation was due from the company to the farmers.

Our illustration of the Æcidium berberidis is taken (in part) from Greville's "Scotch Cryptogamic Flora:" that of the Puccinia graminis from Corda's Icones Fungorum.

ALFRED W. BENNETT.

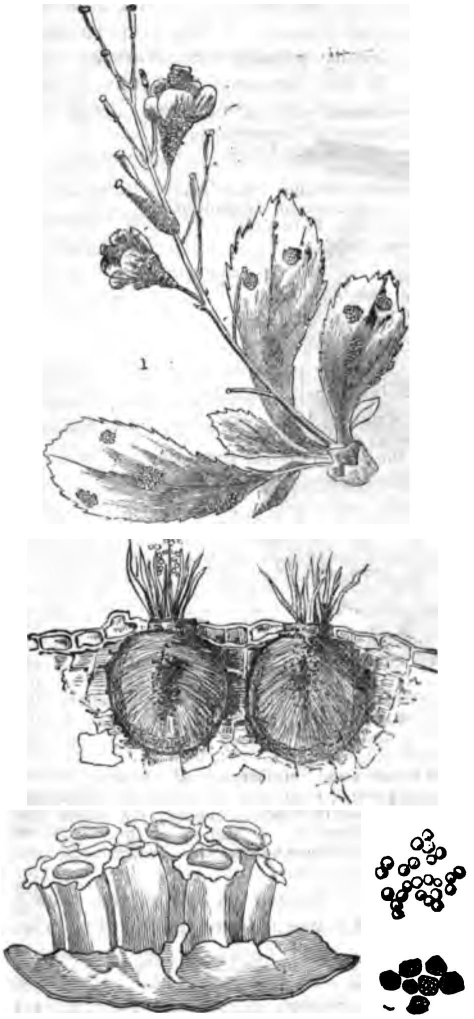


Fig. B.
Æcidium berberidis, Gmel. 1. Branch of berberry with spots of rust, natural size. 2. Spermagonia. 3. A group of Peridia with their orifices dentated. 4. Sporidia. (2, 3, and 4 magnified.)

In considering the question of the influence of the berberry on the production of rust in wheat, assuming that De Bary's observations are perfectly correct, it is necessary to consider the nature of what is commonly called "rust" in cereals. Presuming that his views are strongly confirmed by the analogous connexion of Rœstelia cancellata the pear blight, with the gelatinous parasite of Juniperus sabina, it is well to attend to the following facts:—Professor Henslow, in an article on the diseases of wheat, in the *Journal* of the Royal Agricultural Society, proved distinctly that what is commonly called rust is merely a condition of the common mildew, and this, at a time when comparatively little was known about these parasites, and when many were inclined to accept the views of Unger that they were mere abnormal developments of tissue or spontaneous growths.

The great difficulty has always been that mildew is most prevalent in countries where not a berberry bush is to be found; and the same remark applies to the pear rust, which abounds where not a single plant of savine is to be seen, the parasite of the savine being comparatively of rare occurrence. I think, always assuming the fact of the connexion between two parasites that it may be easily accounted for. It may be true that the berberry plant produces mildew; but how is this? Not probably from the spores o the present year, but from those which fell to the ground the previous season. There is no doubt that these parasites penetrate into the tissues of the young germinating plants, by means not of the original spores, but of minute secondary spores which are produced on them, a circumstance which is fully proved in the case of bunt. This, then, will account for the cereal being mildewed in the neighbourhood of the berberry. But another consideration is necessary to explain the prevalence of mildew where the berberry does not exist, or where it is confined to gardens. The subsidiary spores have, no doubt, equally with the Puccinia itself, the property of reproducing the mildew, and there are always enough of these blown about, either from previous crops or from the neighbouring grasses, especially in the fens, where every ditch is filled with reeds affected more or less with mildew; and thus the parasite may be propagated, season after season, without the Æcidioid form intervening, a circumstance which is not without analogy in other branches of the vegetable kingdom. I may be allowed, perhaps, to recall attention to an article on the development of bunt in the second volume of the *Journal* of the Horticultural Society of London, which seems entirely to have escaped notice on the Continent, where it is stated, in a paper communicated by me on January 18, 1847, with reference to the phenomena described, that "it is quite possible that in plants, as well as in the lower animals, there may be an alternation of generations."

M. J. BERKELEY.

The Country Gentlewoman.

THE PARLOUR GARDENER.

CHAPTER V.

THE PORTABLE GREENHOUSE.

Its Construction—Plants that can be cultivated there—Its principal Utility — Propagating Ornamental Plants—Sowing—Sowing of Azalea Seed—Transplanting and Rearing the Young Plants—The same as regards Rhododendron Seeds—Sowing Orange Seeds—Rearing the Plants—Sowing the Seeds of Flemish Pinks—Sowing of Ranunculus Seeds—Separation of the Young Offsets—Time of their first flowering.

THE variety of plants that may be cultivated in an apartment is greatly increased, when, instead of ornamenting the stand of the parlour with a large basket filled with an assortment of dwarf succulent plants, the same spot is devoted to a portable greenhouse. Greenhouses of this kind may, as well as flower-stands, be ornamented externally in any manner conformable to the style of the rest of the furniture. This point depends entirely on the taste and fortune of those who propose to make use of them.

THE COLD PORTABLE GREENHOUSE.

The portable greenhouse may be cold; that is, without any special means of warming it. It may also be tempered; that is, furnished with an apparatus for producing artificial heat. Except for the size and decoration, more or less elegant, it is nothing more than a great hand glass, of which the panes of glass, supported on a light iron frame, are arranged by means of slips of lead. Many of the upper panes should be made to open by sliding, as well to let air into the interior, so that you may be able to tend and cultivate the plants within.

A multitude of interesting experiments in horticulture may be made, and charming results obtained, in the small space contained within a cold portable greenhouse. Its pots, none of them exceeding the medium size, may contain a complete assortment of the finest plants that are found in greenhouses—not only in such as are not, but in such as are, warmed by artificial means. If the portable greenhouse has not a special apparatus for warming it, it must be placed in a room where people habitually sit, of which it must necessarily take the temperature; and this temperature is pretty nearly that of the artificially warmed greenhouse.

Principal Utility of the Cold Portable Greenhouse.—It is quite probable, ladies, that many of your familiar acquaintance are, like yourself, fond of parlour gardening. If you possess a cold portable greenhouse, you may, if you please, multiply indefinitely the choicest ornamental plants; and, after having reserved for yourself the quantity necessary for keeping up your own stock, there will remain a large supply which will afford you the means of contributing to the enjoyment of your friends by furnishing them with plants.

We must first fill the pots with good sandy heath soil (peat mixed with sand), and then we can proceed with our work at our ease. Nothing is more agreeable, whether we keep the products or give them away, than to see them arrive at a presentable degree of development.

For the purpose of propagation you have three methods at your option: by *sowing*, by *slips*, and by *grafting*. Neither of these is difficult in itself; attention and a great deal of patience are the only requisites to success in all three.

SOWING.

The list of ornamental plants which can be propagated in pots in the portable greenhouse is very long, even if we limit ourselves to gardening in the house alone. We will select from among those most worthy of attention; and their propagation by seeds will give a just idea of how you should proceed with any others that you may have a fancy for.

Sowing of Azalea Seed.—Let us begin with azaleas. Procure seeds of the most admired variety; they will not always produce a shrub exactly like that from which the seeds were gathered. But so much the better. When your young plants bloom for the first time, you will be agreeably surprised to find remarkable novelties, either in the larger size of the corolla or in the brilliancy or delicacy of the colours. Those whose bloom does not seem to you satisfactory—and this will be the smaller number—can be made use of as stocks to receive the grafts of such varieties as you may prefer. Take care not to cover the azalea seed with more than the eighth of an inch of earth, which you must keep constantly damp, without excess of moisture, by watering often and giving very little water at a time. In your portable greenhouse the pots containing the azalea seeds come in contact only with air loaded with moisture, which being seldom changed, scarcely any evaporation takes place; whilst, the temperature there being mild and very equable, the conditions are the best possible for obtaining a good germination of the seeds. Each pot having received but a small number of seeds, the young azaleas will sprout at their ease, without crowding one another. As soon as they have acquired consistence enough to bear transplanting, pull them up one by one and plant [illegible] little pots, w[illegible] they ha[illegible] portable g[illegible]

[illegible]

lemons; these last are most easily reared. Instead of pure heath soil, these seeds require a mixture of heath soil and good manure. By those who carry on gardening as a trade, the pots in which orange and lemon seed are sown are buried in a hotbed, covered with a glazed frame; but this is because they are in haste: for them, to gain time is to gain money. You, ladies, who are not under the empire of the same necessities, by sowing your seeds in February, a time of the year when there is fire in your apartment, will have the temperature of the interior of your portable greenhouse sufficiently high for them to come up in fifteen or twenty days. Your young trees will be much better off under the shelter of your portable greenhouse than anywhere else; air or light in excess would hurt them during the first period of their growth. You will have the pleasure of seeing them grow fast enough if you water them moderately. Towards the month of July they will already be strong; the panes of the greenhouse ought frequently to be kept open, to habituate the young orange trees to contact with air. Some of them can be grafted towards the first of November; the others in the spring of the following year; and when you see the first flowers open, thi will give you more pleasure than all th orange flowers than could be brought t you.

Sowings of Flemish Pink Seed.—Side b side with your sowings of azaleas, rhododer drons, and orange, sow seeds of Flemis pinks, in the same mixture of heath soil an manure that we have directed as the most sui ble for oranges and lemons. Transplante when an inch or two high, the plants will, th [illegible] year, bear the choicest pinks, an [illegible] the finest ornaments

[illegible] *[illegible]nculus Seed.*—Sow als [illegible] This flower is a charmin [illegible] both form and colour; n [illegible]ing in it but perfume; and f [illegible]ening th[illegible] is scarcely a defec [illegible]ing of ranunculus seeds, procur [illegible]ung, very dry and reduced [illegible]ter having slightly wetted th sow the seeds, with but a very shal- ering. They will come up in a few When you see the little leaves of the wither and turn yellow, cease alto- o water them. A few days afterwards, e contents of the pots are perfectly e the pots out of the cold portable use; crumble the contents carefully, s them through a tin colander with all holes. There will remain in the r little plants of ranunculus, each one e than an inch or two long.

ıre afraid, perhaps, ladies, that these delicate plants will make you wait a e for their bloom. You are mistaken. pring sets in, plant them in pots of mon size, in a mixture of good ordinary garden earth and manure; they will all bloom before the end of the warm weather.

You see how many things you can accomplish in horticulture under the cold portable greenhouse, with nothing more than sowings.

Slips offer you pleasures not less varied. Grafting, which your taper fingers, habituated to delicate work, can execute to such perfection, will add to your stock of enjoyments. You will after some time—not a long one—have around you a whole generation of ornamental plants, full of vitality, that your care will have brought into life, and your solicitude will have made to prosper. It will end in your becoming attached to all these charming vegetable productions, as to so many friends of your own creation.

WAX-FLOWER MAKING.

CHAPTER V.—LILIUMS.

ıNY of this class of plants are so adaptable for modelling on account of their : appearance, that it is advisable to with directions concerning the *modus* *i*. Some of the out-door Liliums are h in the mind of the reader, and with hints hereafter given, may serve the : to command a certain degree of suc- › those who willingly try their hand. ıre numerous varieties, but I shall give a description of those that can made, and can be easily procured.

n lancifolium rubrum is very effec- wax, and when made has a handsome nce. It is of large size, and requires ıre both in colouring and modelling. ix petals, or segments, three large and maller ones, all of which are bright : in the centre, shading off to almost t the edges; it has six stamens, the s of which are pale green and the very dark brown. The petals of this must be made of two thicknesses of well pressed together. They will come air be allowed to get between them. A paper pattern of each petal should be taken and the name and number of petals written on each; the two sheets of wax already pressed placed on the paper or cardboard, and the pattern correctly cut. This done, rub some carmine over the centre of the petals, softening it off towards the edges, which should be rubbed very lightly indeed, to produce the light shade. Half way down the centre of each petal is a small pointed piece of green. This can either be cut from wax and placed on, or rubbed with green powder; or liquid colour would answer the purpose in this case. On each side of this strip of green is a kind of fine fringe tipped with carmine, This is cut from a piece of white wax, the edge being coloured first. The raised spots are made by placing the point of the bone pin at short distances apart in the petal and pressing it at the same time, taking care not to make holes during the operation. On these an extra touch of colour is required. The petals so far done, proceed to curl the edges by rolling small portions of the wax on the fingers by means of the thickest steel pin. The filaments, which are six in number, made of thin wire neatly covered with a strip of pale green wax. The anthers are made of a small piece of wax rolled between the fingers and then flattened, placed on the filaments, rubbed over with gum, and dipped in brown powder. When these are done they must be placed on the foundation. See that the petals are arranged as naturally as possible.

The Lilium lancifolium album is made in the same way, leaving out the colour, instead of which white bloom must be used in the rubbing-over process.

The Turk's Cap Lily, or Lilium Martagon, looks well in wax. It is of a bright crimson colour. The petals are six in number; there is no shading required, as they are all the same. The stamens are reddish brown. When the pattern is cut and the wax ready, colour the petals with a mixture of scarlet and a small portion of carmine; then curl them, by using the lily-pin dexterously under the back of each. In order to get a correct copy a natural flower should be obtained.

The common Garden Lily (Lilium candidum) is pretty for modelling. It is made after the same manner as the others. The petals are white, with a double mark down the centre of each petal. This is reproduced by placing the pin twice at the back of each. The filaments are pale green with yellow anthers.

The Tiger Lily (Lilium tigrinum) looks well in wax. There are the same number of petals in it as in those previously named, of a deep orange colour, spotted red with black. The spots must be made of wax colour and thickly [illegible]

[illegible]

in appearance to those flowers that a ranged in the higher vases. The white water-lily, Nymphæa alba, look well when made. There are three of petals, and six in each row; the consists of segments the same sha the petals, but are dark green outsid white inside. They must be compo double dark green wax, lined with the nest white wax. The petals being m lily-wax, require a substantial calyx t port them, and should be covered with before they are moulded. There are s rows of stamens, the shortest being i centre. They are cut from bright wax, and moulded in the shape of very tubes. The single yellow water-lily, phæa lutea, is worth copying, but is pretty-looking as the white one. The fl have round, cup-shaped petals, the o of which, at the base, is dark green. ovary resembles in shape the seed-po poppy, and has several rows of yello mens. This flower is of a bright deep colour.

Fuchsias, both single and double, exceedingly pretty in wax. The flo the fuchsia consists of four petals of colours. according to the variety, an corolla. This has four kinds of which are very much like small rose in shape. Those of the white fuchsi generally rose-coloured or pink; and of the crimson, a deep violet. The st should be made of white cotton dip gum, a small knot being made at the each filament. This, whilst wet, mu dipped in powder of whatever colo required. The crimson fuchsias with corollas are very pretty in wax.

Geraniums are very showy in their a among other flowers. They hav petals. In imitating a scarlet geraniu [illegible] powder, in which a very smal [illegible] of crimson should be mixed. [illegible] made of fine white [illegible] calyces and stems o green wax. The pink and white va equally suitable for modelling.

[illegible] is a great acquisition in a

of flowers, especially for the purpose of covering a basket-handle or the front of a vase: it consists of a great many rows of petals, of a pale green colour, tapering in shape. The green foundation should be placed a good way down; the stem and the wax not too sparingly rolled on it, the petals then moulded, commencing at the smallest end to place them on the stem. White and yellow jasmine are very pretty in wax, as is also the single white clematis: these will all form climbers if required.

Carnations of different shades of colour look well when made, especially the crimson clove and the white one; there is also a pale yellow suitable for wax. The petals are mostly pointed at the edges. In order to be closely imitated, they must be very carefully cut. The foliage is simply cut from two thicknesses of green wax, in long narrow strips resembling grass.

Dahlias of various colours are bold looking, perhaps too much so to mix with the more delicate and smaller flowers. The smaller varieties are the most suitable, and look the neatest when made. They should be made of medium wax, and a good-formed one tained to copy from.—*Annie M. Williams.*

A LADY'S SYSTEM OF BULB GROWING.

As you give some encouragement to ladies to detail their mishaps as well as their successes, permit me to tell you and your readers how I have contrived to cultivate (probably you would not call it cultivation) my hyacinths in glasses on my parlour mantel-piece and window. Of course, it must be understood that I am speaking of the past, and my reason for penning you this letter is, because I am awakened to a sense of endeavouring to improve in the future. Unfortunately for ladies living in town, the only aid they have is from gardening books, and the instructions often imparted are so ridiculously absurd to us who really know nothing about the stock phrases passing current among gardeners, that the advice imparted is often more puzzling and perplexing than instructive. I beg pardon. I ought to acknowledge the help given by the young men and boys at the seed shops, where bulbs are generally sold. In selecting bulbs, and fishing for advice in an establishment of the kind, the following is a sample of the questions asked, and the answers given:—

"Are you sure, now, that these bulbs you have recommended by name are suitable for glasses?"

"Yes, ma'am."

"Do I require to change the water in the glasses often?"

"Oh, yes, ma'am."

"How often?"

(Hesitates a little, then stammers out), "Once a fortnight."

"Some people recommend, I see, a little manure water. Is that good for them?"

"Yes, ma'am; a little ammonia."

"Guano will do, then; but won't that be dangerous?"

"Oh, no, ma'am; once a fortnight."

"Will they grow in any of the rooms of the house, and do they need light, like other plants?"

"Yes, anywhere. Only change the water, and when they are coming into flower they must be near the window."

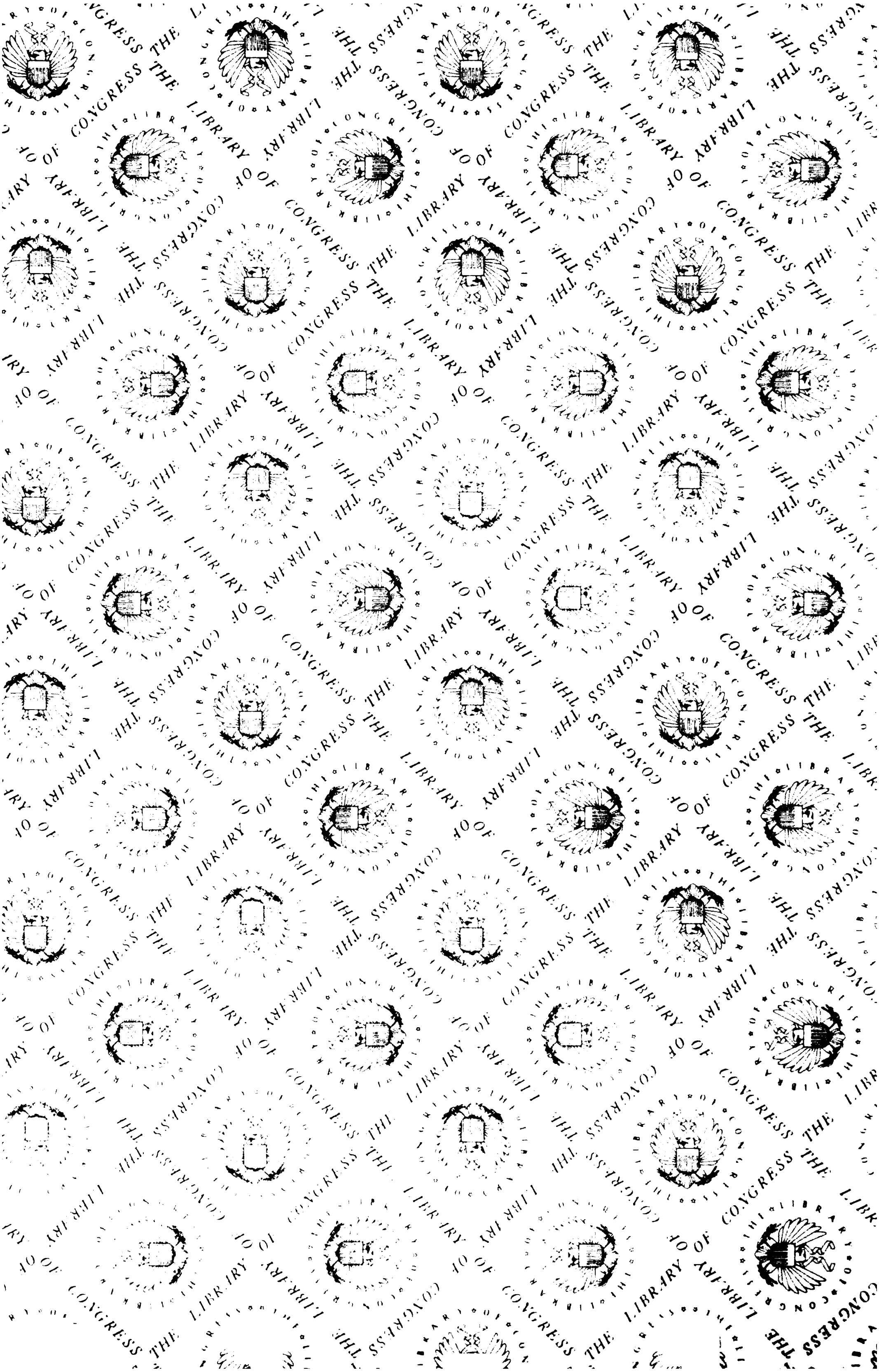
"Thank you. Good morning."

Now, the sum total of this advice, and all my reading, has not made me what you would call a successful grower; and I think I can tell you how I have not succeeded.

I selected twelve bulbs from a catalogue, which is duly sent me by the seedsman with whom I deal. I planted or placed them in Tye's registered glasses, and set them on my mantelpiece full of water. This would be about the end of October. Very anxious, as I w to have flowers as good as I could, I almost literally attended to the instructions given me. Only I had some doubts about the "ammonia," as I had read that stimulants should only be given sparingly, and when the flower-spike was growing up out of the bulb. I therefore took the precautioh to give six of them guano water, and six of them the pure soft water collected from the roof of an outhouse, into what we call our soft-water cistern. I changed the water, as recommended, although I had doubts about the necessity of so doing during the early part of winter. Our parlour is always well heated, and often the temperature on the mantelpiece, as told by a thermometer, varied from 55 deg. to 62 deg. Sometimes it might be higher. Well, now, I will tell you the results.

The bulbs in all the glasses grew, as I thought, very well. Those on which I experimented with the guano water, were evidently the worse for it, for three out of the six went off altogether, and I had no good of them; the other three sent up small flower-spikes, with narrow, what you call lean foliage; and although they pleased some of my lady friends, I knew that an error had been committed, which I determined should not occur again—taking my observations, and coming to my decision because of the relative merits of those which were dosed with guano and those which were not. The six that had nothing but soft water to live upon, grew quite to my satisfaction then; but I hope very much to improve upon [illegible] last year's management [illegible] ing five, especially a Mont Blanc, a superb white, and the beautiful pink Madame Hodson, were the admiration of all who saw them. I moved them from the mantelpiece to the window, when I supposed the leaves wanted more light, and every day afterwards they improved in colour—both flowers and foliage, so much so, that I regretted I had not the *gumption* (excuse the word) to place them in that position much sooner. But the flower stems were long, and so were the leaves, and they both needed support. I did not like this so much, as it detracted from the natural appearance of the plants.

On thinking over the matter, I estimate at once the propriety of placing the bulbs, when first put in the glasses, in a cold room, because mine on the hot mantelpiece grew faster at the top, after the top began to move, than the roots. Now what I want is early flowers, with additional texture, better colour, and more persistency, but which I have not yet got, but what I hope to be able to get when my flowers make their appearance next spring. I hope and trust that I shall be rewarded with greater success in time to come than I have had in time past. It is so vexing and annoying to have only one-half crop or yield, when a full crop is realizable. Six or eight out of the twelve do not please me; and but for the pleasure I have experienced from the soft and waxy tints of the flowers, and their delightful fragrance, I might have given up hyacinth-growing in disgust, as I don't like to do things by halves. *-Margaret B.*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